Industrial Standardization

August

Safety in Welding Is Purpose of New War Standard

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1944

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RUTH E. MASON, Editor

Our Front Cover: Strength and dependability are gas-welded into a transport airplane fuselage by an operator who works skillfully and safely under the American War Standard for Safety in Electric and Gas Welding and Cutting Operations.

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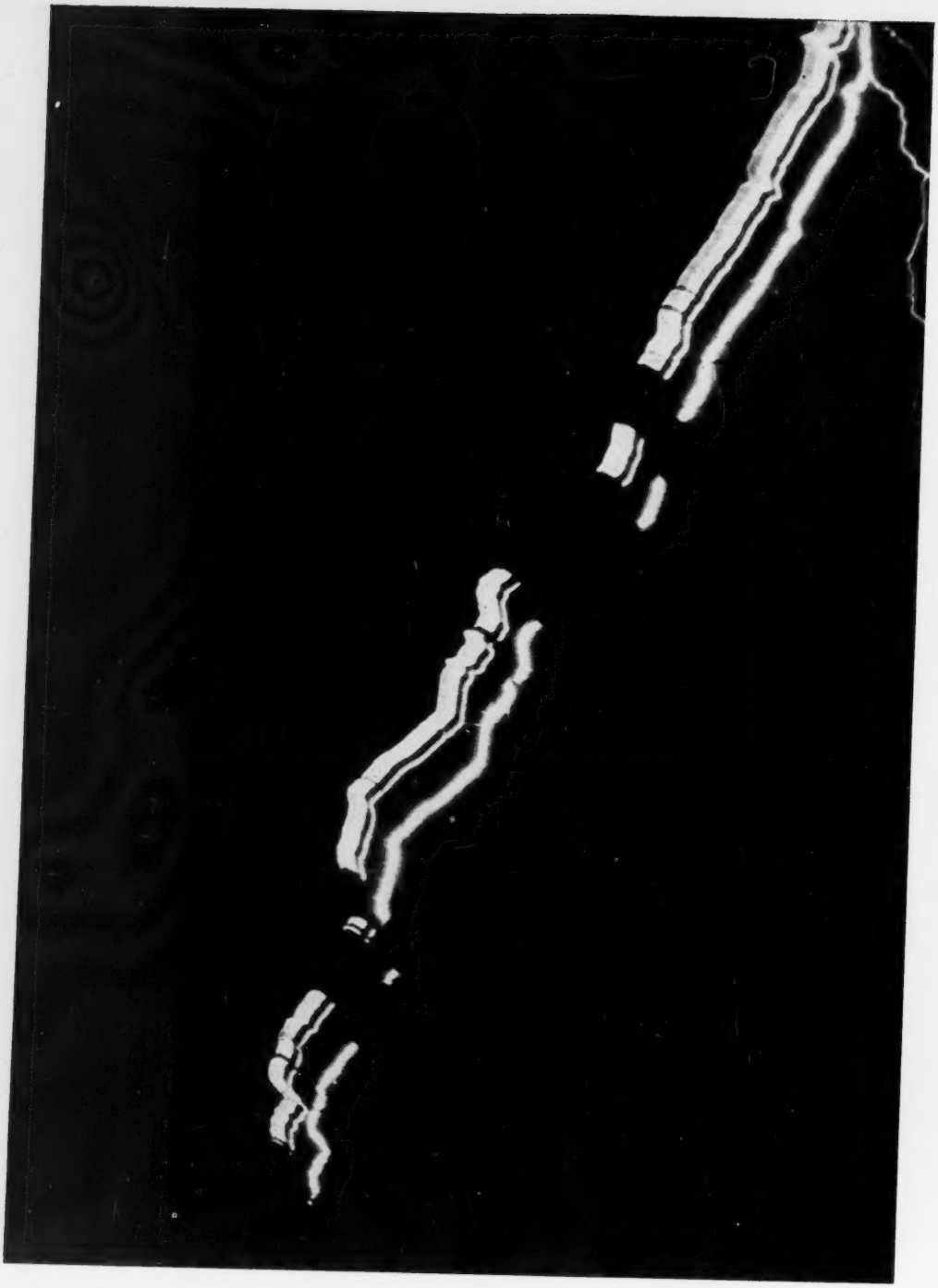


Summer lightning photographed at Winnipeg, Manitoba

(See article, page 15

Safety in Welding Is Purpose of New War Standard

by John E. Long[1]

Chairman, ASA War Committee on Safety in Electric and Gas Welding and Cutting Operations

Skyrocketing of welding in war production makes safety measures urgent for conservation of manpower and materials

SINCE Pearl Harbor, welded construction has skyrocketed until today it has attained a position of importance even greater than that of riveted construction. Although welding has been used for many years, it was given its greatest impetus following Pearl Harbor when the demand for ships—and more ships—speeded the work in every yard in the United States. Certain yards had already begun to use welded construction as early as 1934 and 1935, but welding did not come into general use until shortages of materials and manpower brought urgent need for conservation. Welding, which joins the edges of the metal into one piece without overlapping, and hence with no need of caulking to seal the overlap, is an important saving in both material and working time. For this reason, the majority of the ships in the huge new fleets produced in this war are now welded.

Shipbuilding may be the most dramatic of the new uses of welding, but it is not the only field in which welding has made huge strides. Steel boilers, large steel piping (the Big Inch, for example), gun mounts, steel tubular frames for airplanes—all are welded. Even Army tanks are welded, eliminating the rivets which under the effect of an explosion would sometimes tear loose from the body of the tank and fly through the air like bullets, frequently causing more damage inside the tank than the direct effect of the bomb itself.

Dangers in Welding Process

The tremendous increase in the use of welding during the past few years and its importance in war production have called attention to the losses, not only in human suffering, but also in manpower, production time, materials and property, to which both workers and industry may be subjected because of the dangers inherent in the welding process.

Because of the importance of such hazards, the American Welding Society, the International Acetylene Association, the National Electrical Manufacturers Association, and the Division of Labor Standards of the U. S. Department of Labor asked the American Standards Association to initiate a project to develop an American War Standard for Safety in Electric and Gas Welding and Cutting Operations. These groups all emphasized that the extent of welding operations now being carried on in connection with war work, and the importance of conserving manpower, indicated the need for a safety standard.

In order to speed the work, the project was initiated by the ASA under its War Standards Procedure, and a war committee of experts on the subject was organized. A draft standard developed by the war committee was circulated to more than 750 manufacturers and users of welding and cutting equipment, and when found to be acceptable, was approved as an American War Standard by the American Standards Association.

The new American War Standard for Safety in Electric and Gas Welding and Cutting Operations, Z49.1-1944, is a guide for the protection of workers from injuries and illnesses which may result from the installation, operation, and maintenance of electric and gas welding and cutting equipment. It is also a guide for the protection of property from fire or other damage. It applies to all welding, cutting, brazing, or lead-burning operations, although additional safeguards not included in the standard may be necessary in such especially hazardous industries as the manufacture of explosives or in shell-loading plants.

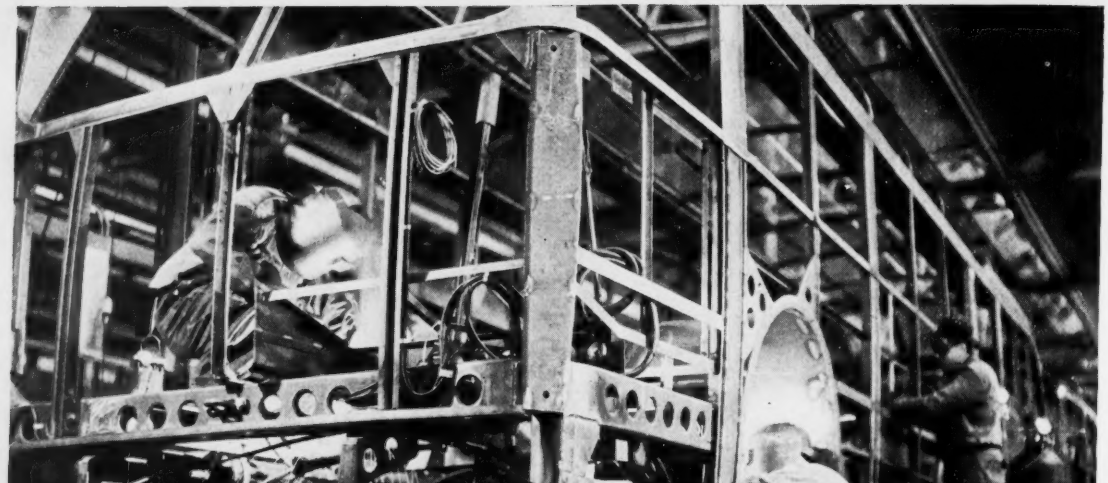
In preparing the standard, the committee devoted special sections to the particular hazards of certain types of welding—gas welding and cutting; arc welding and arc cutting; and resistance welding—but also recognized the fact that certain types of hazards are common to all. For that reason, the committee also included general sections on fire prevention, protection of personnel, and ventilation and health protection.

Accidents in Gas Welding

In gas welding and cutting, flammable gases and oxygen are combined to produce the work flame. If through leaks or careless practices fuel gases are permitted to mix with either oxygen or air, disastrous explosions or fires are the usual result. There is always the danger, too, that a gas cylinder may be reused and filled with a gas other than that which it originally contained. If the cylinder is not carefully marked to indicate the change, the workman has no way of knowing that he should take precautions suitable to the gas he is using.

In order to avoid such hazards, the section on gas

[1] Delaware and Hudson Railroad Corporation, Albany, N. Y.



The electric arc welds a 45-passenger bus, product of American automotive genius

welding and cutting equipment gives detailed recommendations on safe handling and storage of the gases used and on marking storage, and handling of fuel-gas cylinders. The section also outlines requirements for the generators used in generating the gas for welding and cutting, and includes provisions for operation and maintenance, for generator rooms or compartments, and for the piping systems for each type of gas used. Methods of procedure to follow and precautions which should be taken in order to protect both life and property are outlined.

Most of the material in the section on gas welding and cutting has been in general use for some time in state codes and in general safety regulations.

Much Original Work on Electric Section

In the section on electric welding, on the other hand, more original work was done by the War Committee than for the section on gas welding. In the case of electric welding, much of the committee's work was pioneering work, which brought into the standard the latest available information. Certain provisions on the installation of the electrical equipment, grounding, etc, for instance, are in accordance with work of the National Electrical Code committee, which has not yet been completed. This material, which represents the latest available information at the time the code was approved, was included with the understanding that these particular provisions undoubtedly will have to be revised, or brought up to date when the National Electrical Code committee comes to a final agreement. The War Committee decided that it was better to include the most recent information in the new safety code, even though changes might have to be made later, rather than to omit these sections entirely.

The voltages required for arc welding are low and normally would not cause injury or severe shock, but in hot or wet weather when the worker is covered with perspiration or wet from rain, and thus in a condition to conduct electricity, he may receive serious shocks, which may even be dangerous to life. Included in the new standard are the best practices known at the present time for preventing such shock.

Precautions in installation are particularly important in connection with electric arc welding, and detailed recommendations in the code give information about grounding of welder case, rating of supply conductors, connection of single-phase transformer-type a-c welders to single—or polyphase supply circuits, overcurrent protection, control switch for alternating-current transformer-type welders, and ground returns. All installations, including power supply, must be in accordance with the requirements of the National Electrical Code.

Electric arc welding also offers special hazards because of the intensity of the light of the arc and because of the infrared and ultra-violet light which are features of the electric arc. To provide the most satisfactory protection to workers, therefore, the standard includes a table for the shade of the goggle lens best suited for eye protection for the different types of work.

No Nationally Recognized Specification

When preparing the section on resistance welding equipment, the War Committee found that there were no nationally recognized specifications for the installation of this type of equipment. The committee, therefore, included material which appeared to be most universally acceptable at the time. Although not a thoroughly comprehensive treatment of the subject, this section does include general requirements for installation of resistance welding equipment in conformity with the National Electrical Safety Code and the National Electrical Code. Special provisions on spot welders, press welders, portable welders, and flash-welding equipment point out individual precautions for each type of resistance welding equipment. In addition, it

is recommended that a careful job analysis be made of the operations to be performed on each welding machine to determine the safeguards and personal protective equipment which may be needed for that machine.

Normandie Fire Due to Welding Sparks

The danger from fire in connection with all types of welding and cutting operations is so important that an entire section has been devoted to it. Some costly recent fires—that of the U.S.S. *Lafayette* (originally the S.S. *Normandie*)—were due to welding sparks falling into flammable material and could probably have been prevented if the recommendations of the new standard had been available and had been followed. Special requirements have also been included to avoid fire hazards when welding or cutting must be performed in rooms or compartments which have previously contained flammable gases or liquids.

Other hazards common to all types of welding have been covered in the sections on protection of personnel, and on ventilation and health protection. Provisions for the use of goggles, helmets, and hand shields are included for the personal protection of the workers, and reference is also made to War Standards on asbestos and leather clothing which will be useful to protect the welder from heat and from flying sparks and flying metal. Some of these War Standards for protective clothing have already been completed by the ASA War Committee, and others are nearing completion. The welding code recommends the use of flameproof gauntlet gloves, flameproof aprons, woolen clothing rather than cotton, and that sleeves and collars be kept buttoned and pockets eliminated to prevent sparks from lodging in them. The use of safety shoes is recommended and reference is made to the American War Standards for Protective Occupational Footwear, Z41.

The problem of ventilation in connection with welding is somewhat complicated because of the nature of the processes involved. Some welding jobs are done in a confined space, in the inner bottoms of ships, for example, or in the inside of a tank. In such cases, air must be supplied from outside. Until recently, most of such welding was done on low-carbon steel or iron, which had little toxic substance. Now, however, in many ships welding is being done on plates that have been galvanized, and during the welding some of the zinc coating of the plate is melted off. This operation releases galvo-fumes—zinc-oxide fumes—which have been found to be dangerously toxic. Welding on metal that has been chromium plated or painted with a paint containing lead or cadmium also has been found to be dangerous.

Standard Allows for Different Working Conditions

Because of the different problems involved, the standard makes provision for these different working conditions. Under ordinary conditions, when the welding of clean carbon steel is carried on in large or well ventilated areas with bare or coated carbon steel electrodes and welding rods, no special ventilation or protection is required. When welding is done in a space entirely screened on all sides or in confined areas, ventilation systems are required to keep the toxic fumes or dust below the maximum allowable concentration defined in the American Standards defining allowable concentrations of toxic dusts and gases (Z37). In case it is impossible to keep the concentration of gas or fumes below the allowable concentration, welding operators are required to use respiratory protective equipment approved by the U.S. Bureau of Mines.

In connection with this section on ventilation, a paragraph in the foreword of the standard explains that although certain parts of the fundamental requirements for ventilation may warrant further investigation, the committee has endeavored to include in this standard, for use in the war effort, those requirements which appear to be most acceptable at this time. The committee intends to give further consideration to all available research and to reports of field investigations. As soon as any ventilation requirements are developed which are more acceptable, they will be considered for possible revision of the standard.

ASA War Committee Prepared New Safety Standard

Members of the ASA War Committee on Safety in Electric and Gas Welding and Cutting Operations, Z49, came together from many different organizations closely concerned with welding safety. They are:

John E. Long, Delaware and Hudson Railroad Corporation, *Chairman*
Major Robert F. Alexander, War Department, Corps of Engineers
E. C. Barnes, Westinghouse Electric and Manufacturing Company
A. C. Cranch (Dr.), Union Carbide and Carbon Corporation
L. Erskine, Division of Labor Standards, U. S. Department of Labor (R. P. Blake, *Alternate*)
S. V. James, Underwriters Laboratories, Inc (C. W. Rulon, *Alternate*)
H. O. Klinke, Republic Aviation Corporation
H. E. Newall, National Board of Fire Underwriters
E. B. Landry, Shore Establishments Division, U. S. Navy (Lt. Com. G. E. Twining (Ret.), *Alternate*)
Oscar F. Lehman, Chrysler Corporation
Robert G. Milligan, Ocean Accident and Guarantee Corporation
Major Eliot V. Parker, War Department, Provost Marshal General's Office
H. L. Palmer, General Electric Company
W. W. Reddie, Westinghouse Electric and Manufacturing Company
H. F. Reinhard, International Acetylene Association (John J. Crowe, *Alternate*)
John Roach, State of New Jersey Department of Labor
John M. Roche, National Safety Council
Harry E. Seifert, National Institute of Health
H. S. Smith, Linde Air Products Company
William Wiesenberg, War Department, Ordnance Department
S. E. Whiting, Liberty Mutual Insurance Company
James W. Wilson, U. S. Maritime Commission
H. G. Lamb, ASA staff, served as secretary for the committee.

After work on the proposed standard was completed by the War Committee, the draft was circulated to more than 750 manufacturers and users of welding and cutting equipment. After a majority of these organizations indicated that it was acceptable, it was approved as American War Standard by the ASA.

In preparing the American War Standard, Safety in Electric and Gas Welding and Cutting Operations, the War Committee attempted to include in the standard itself as much technical information as possible rather than relying on references to other documents. For this reason, the standard is almost entirely self-contained.

Although the standard was approved just this spring, the interest which has already been shown in it is most gratifying. At the end of the war all parties concerned may decide that a peacetime project for safety in welding should be organized and that a regular American Standard should be prepared for use in all industries.

War Standard Now Available

Copies of the American War Standard, Safety in Electric and Gas Welding and Cutting Operations, Z49.1-1944, are now available from the American Standards Association at 40 cents each.

Textile Research Center to Aid Industry

FOR a number of years farsighted men interested in the textile industry have been trying to establish a central organization for textile research in the United States. At a meeting of the Textile Research Institute in New York last November a plan for such a project was outlined. This will provide for: (1) Coverage of all branches of the textile industry, and all fibers; (2) location of the Institute's laboratories near New York; (3) development of a program covering fundamental research, applied research, economic research, graduate training, and a research information service; (4) raising of a research fund of $300,000 a year for five years, or $1,500,000 plus a capital fund of $500,000.

A major step toward the fulfillment of this plan was taken when the Textile Research Institute bought a building in Princeton, New Jersey, to house its fundamental research laboratories, textile library, and a graduate training program. As soon as the house is suitably equipped, the Textile Foundation and the Institute's fundamental research staff will center their activities there. Each year a few college graduates will be picked to train for textile specialization in masters' or doctors' degrees in chemistry, physics, chemical engineering, etc. They will use the facilities of Princeton University and must meet the requirements of both the Institute and the University.

The completion of this plan will be of immeasureable value to the future of the textile industry, those closely connected with it declare. As the professions have research programs and laboratories and highly specialized personnel necessary to carry on investigations vital to their growth, so too, will manufacturers of textiles benefit in time from the far-reaching work carried on by their own Institute-trained experts, they explain.

Dr. Milton Harris, director of fundamental research for the Textile Foundation at the National Bureau of Standards, is to serve also as director of fundamental research for the Institute. The Director of Applied Research of the Institute is Giles E. Hopkins, while Douglas G. Woolf, first vice-president of the Institute, is directing the economic research and research information activities.

Simplified Practice in Post-War Industry

Before the war, various industries suffered from high production costs due to over-diversification as to sizes, kinds, and varieties of manufactured products. In order to save materials, manpower, and production capacity, War Production Board Limitation Orders cut down to a minimum the varied lines produced. The fact that economy will have to be exercised in the peacetime world and that many manufacturers believe that they have found the way in revisions of the orders which war made necessary was the theme of an article in *Domestic Commerce* recently by Edwin W. Ely, Chief, Division of Simplified Practice, National Bureau of Standards.

"It is known to the Division of Simplified Practice that certain industries, now governed by mandatory orders that involve simplification (WPB Limitation Orders) desire to retain the benefits of simplification after the war," Mr. Ely said. "Each of these industries wishes for a transition from some particular mandatory order to a post-war voluntary Simplified Practice Recommendation which will preserve those features of the order that merit peacetime adaptation—benefits which the industry could lose if no plan is ready to fill the place of the order when it shall have been revoked."

"Simplification is not a preventive," Mr. Ely continued. "It is exclusively a curative. An industry tries out everything in the way of design and, by trial and error, prospers. In the process, the industry becomes loaded down with varieties that, in the course of time, prove to have been ephemeral instead of classic. This litter of over-diversification could be swept aside, hurting no one and providing elbow room and a certain amount of released invested capital.

"Perhaps an industry will some day be in a position to say:

"We believe that this is progress, not retrogression, because we are substantially aiding every industry, every individual worker, and every individual craftsman to do his specialized job better, by placing at his disposal the right article for his use. We have rid ourselves of the nonessentials, and the development of the art of designing our products has been given a stimulant."

Committee Uses New Data in Revised Lightning Arrester Standard

by K. B. McEachron[1]

Chairman, Sectional Committee on Lightning Arresters, C62

A LIGHTNING arrester is defined as "a device which has the property of reducing the voltage of a surge applied to its terminals, is capable of interrupting follow current, if present, and restores itself to its original operating conditions." The recently revised American Standard for Lightning Arresters, C62.1-1944, applies to all types of lightning arresters designed for the protection of alternating-current power circuits, and is concerned particularly with arresters having a valve-element with non-linear volt-ampere characteristic to limit the follow current. Obviously, devices such as the expulsion protector tube are not covered in this standard.

To secure best protection for power circuits, it is desirable to use an arrester whose rating is low with respect to the line-to-ground voltage expected on the system where the arrester is to be used. Since the arrester is sensitive to system over-voltages, however, there are certain operating conditions, enumerated in the standard, which must be considered when selecting the arrester rating in order to avoid unnecessary damage to the arrester by misapplication.

The voltage rating of a lightning arrester is the designated maximum generated voltage of normal frequency on which the arrester is designed to be used between its line and ground terminals.

Among the numerous definitions given—and the standard is intended to be self-contained in this respect—are new definitions for wave front, wave tail, and wave shape, the nominal value of the wave tail being the time from virtual zero time of the impulse to the instant at which one-half crest value is reached on the wave tail. Since the lightning arrester standard is concerned with current waves, as well as voltage waves, it is necessary to recognize a difference in the method of determining virtual zero, used in measuring time, the 10 and 90 percent of crest value points being used for the current wave, and the 30 and 90 percent of crest value being used for the voltage wave.

The station-type arrester is defined as not only having a better over-all protective characteristic than the line and distribution types, but has a discharge capacity in excess of 100,000 amperes on current surges of the 5 x 10 microsecond wave shape. The discharge capacity of the line and distribution types will exceed 65,000 amperes on the same wave shape.

Performance Characteristics

The performance characteristics of an arrester are to be determined from volt-time and corresponding ampere-time curves plotted from data taken under specified conditions using an impulse generator and cathode-ray oscillograph. These curves, together with a consideration of certain conditions external to the arrester, determine the ability of the arrester to protect apparatus against lightning surges. In addition, the arrester also must successfully perform the unit operating cycle at least 30 times, which determines the arrester's ability to restore itself to its original operating condition after passage of a surge.

Tests

This standard makes a distinction between design, acceptance, and routine tests.

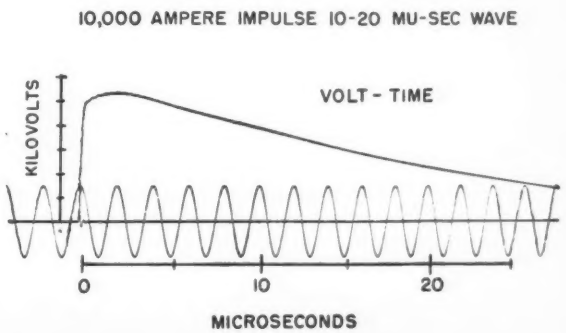
Alternating-Voltage Design Tests

The standard provides for alternating-voltage wet and dry tests on the insulation of the arrester, but with the internal parts removed. Provision is also made for alternating-voltage breakdown tests on completely assembled arresters which are provided with a series gap, the tests to be made under wet and dry conditions.

Impulse Design Tests

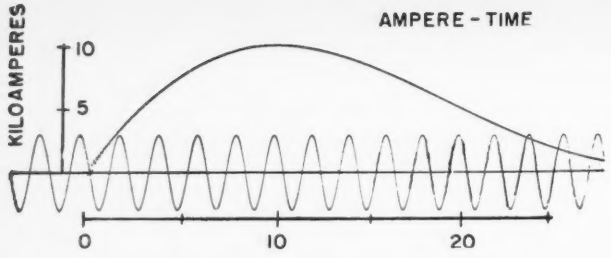
To know the margin between the arrester impulse breakdown and the demonstrated impulse strength of insulation to be protected, a volt-time characteristic is taken using a generator giving an open-circuit 1½ x 40 wave. The crest voltage is varied from the critical breakdown value to such a voltage as will cause breakdown in approximately one-half microsecond. The data thus obtained are plotted to give the impulse breakdown characteristic of the arrester.

Similarly, the average discharge voltage characteristic (or IR voltage) is obtained under a variety of conditions, crest current values up to 20,000 amperes being used. A sufficient number of surges of proper magnitude are applied and average volt-time and ampere-time values obtained through the use of a cathode-ray oscillograph and impulse generator. These data are



Volt-Time characteristics of a lightning arrester

[1] Research Engineer, High Voltage Practice, General Electric Company, Pittsfield, Mass.



Ampere-Time characteristics of a lightning arrester

used to determine the average discharge voltage which is characteristic for the conditions specified; *i.e.*, 10 x 20 microsecond current wave with a surge current of 5,000 amperes per microsecond wave front.

Acceptance Tests

The standard lists definite acceptance tests which are to be made when the purchaser specifies that arresters shall be tested in accordance with this standard. These tests include a discharge voltage test made with a 10 x 20 microsecond wave having a crest value of 10,000 amperes for station-type arresters, and 5,000 amperes for line and distribution types. The impulse-breakdown test is made with a voltage wave rising at the rate of 100 kv per microsecond for each 12 kv of arrester rating.

A comparison between these standards and the last issue dated March, 1936, indicates a great improvement in the technique of impulse testing in the measurement of both voltage waves and current waves. It also illustrates much progress in the effort to make lightning arresters suitable for handling most direct strokes. In 1936 it was necessary to limit the values of current and rates of rise on account of the limitations of testing equipment. These limitations have been removed to a large extent so that the various laboratories are now able to provide impulse tests which compare favorably with what might be called "a typical direct stroke."

The present standards represent the effort over a period of years on the part of various committees involved. Further revision will be made as the necessity arises.

The American Standard for Lightning Arresters, C62.1-1944, is an important step in the protection of electrical equipment against the effects of lightning. Each year thousands of dollars and man-hours are lost through the breakdown of expensive equipment when lightning, striking on or near an electric power line, causes a sudden jump in electric voltage. When there is a sudden attack of alien voltage, the lightning arrester diverts the unusually large voltage to the ground, and returns the circuit again to its original condition.

The 1936 edition of the standard was drawn up by the subcommittee of the American Institute of Electrical Engineers' Technical Committee on Protective Devices. Before approval by the AIEE and submittal to ASA for subsequent approval, two editions of the standard were published in order to stimulate comment and suggestions. Since that edition, an ASA Sectional Committee has been organized to bring together the organizations concerned with the standard under the sponsorship of the AIEE. New information and developments since the 1936 edition made it necessary to develop the 1944 edition, particularly because of the importance of keeping war production machines always in operation.

Copies of the American Standard for Lightning Arresters (C62.1-1944), sponsored by the AIEE, may be obtained from the American Standards Association at 30 cents per copy.

Canada and U. S. Exchange Committee Representatives

The Canadian Engineering Standards Committee has announced that E. W. McLeod, of the Hydro-Electric Power Commission at Toronto, has been nominated as a corresponding member to represent CESA on the Electrical Committee of the National Fire Protection Association (the ASA Sectional Committee on the National Electrical Code, C1). This appointment follows the designation of representatives of the National Fire Protection Association and of the National Electrical Manufacturers Association on the CESA Committee for the Canadian Electrical Code. The Canadian Engineering Standards Association will be in further contact with American specification work through its representation on the Committee on Correlating of Chemical Compositions and Steel Mill Products of the War Production Board. J. G. Morrow has been designated CESA representative on this committee.

Mexico Adopts Elevator Safety Code

The manager of the Otis Elevator Company in Mexico, Enrique Hubard, reports to ASA's Inter-American Department that the American Standard Safety Code for Elevators, Escalators, and Dumbwaiters (A17.1-1937) has been accepted officially in that country by the Departments del Distrits Federal. He also suggests that steps might be taken in other southern nations so that this standard may eventually become the national safety code for elevators in the Latin American countries.

New ASA Company Members

The following organizations have recently joined the American Standards Association as Company Members:

Airequipt Manufacturing Company, Inc, Mount Vernon, N. Y.
Erie Resistor Corporation, Erie, Pa.
Shallcross Manufacturing Company, Colingdale, Pa.

OPA Use of Standards in Pricing Still in Controversy

Ruling by Comptroller General Forces OPA to Abandon Use of AMA Grades in Pricing Canned Fruits and Vegetables

The controversy over the use of standards in price regulations again became an issue in Congress recently when members of the House and, later, members of the Senate, read into the record their divergent interpretations of the meaning of the Taft Amendment limiting OPA's authority in connection with the use of standards. The amendment, originally adopted last year, was included without change in the Act extending the life of OPA.

Two divergent viewpoints as to the meaning of the Taft Amendment[1] were stated by members of House and Senate during the hearings on these two bills. One viewpoint, sponsored by certain members of the House of Representatives, is that OPA is not authorized to use standards in any case unless such standards have been in general use in the trade or industry before the order is issued, or unless they have been previously established by government action. The other interpretation, which President Roosevelt declared[2] was his understanding when he signed the bill in July, 1943, also gives OPA authority to use standards when such standards are "absolutely essential to an effective system of fixing prices."

The first interpretation was stated by Representative Charles A. Halleck. The Taft Amendment "specifically prohibited the OPA from resorting to that scheme of standardization and compulsory grade labeling according to standard specifications as a part of the price-control program," Representative Halleck said. The original prohibition applied to all standards and specifications, he declared. "Subsequently," he continued, "it was pointed out that there had grown up in certain industries or over-all industrial classifications specifications or standards that had been accepted in general use, so a proviso was added to the prohibition excepting those standards and specifications that had been in general use prior to that time."

Senator Wagner of New York, however, told the Senate in his conference report on the Stabilization Extension Bill, that the contrary interpretation was the one held by the Senate conferees. He said:

"The bill re-enacts without change section 2(j) of the present act, which was added to the act by the Commodity Credit Corporation Act of 1943. This will leave in effect the established construction of that subsection which is that the Price Administration is authorized to make use of standards or specifications in establishing maximum prices in three situations and in those situations only: First, where the standards or specifications have been in general use in the trade or industry affected; second, where they have been promulgated and their use lawfully required by another Government agency; and third, when the administrator finds that there is no practicable alternative for securing effective price control of the commodity involved. A denial of authority to use standards or specifications in any one of those three situations would seriously impair the price control program. I make this statement as chairman of the Senate Conference because there is a statement in the report of the House managers which might be understood to the contrary, and I want to make clear the understanding of the Senate conferees."

Opposition Attaches Rider to Appropriation Bill

The entire question as to the intention of Congress in limiting OPA's authority to use standards was brought to the fore in connection with an amendment to the Second Deficiency Appropriation Bill (carrying the appropriation for the OPA). An amendment to that bill, prohibiting the use of Government funds to pay the salary of any OPA employee who uses standards or specifications other than those already in general use, was introduced by Representative Taber of New York during the final consideration of the bill. The amendment was adopted, but only after serious protest from some of the members of Congress, and after it had been changed to apply only to processed fruits and vegetables.

The purpose of this rider which was proposed by the National Canners Association is to prohibit the use of Government standards by the OPA in pricing canned goods. It brought a formal statement from Senator Barkley, member of the Senate Committee on Banking and Currency, protesting the manner in which the change was brought about. Said Senator Barkley: "All interested persons had an opportunity to present their views to the Senate and House Banking and Currency Committees in the hearings on the Stabilization Extension Act. Neither the committees nor the Congress believed that changes should be made.

"The Appropriation Bill, however, now contains a limitation upon the payment of salaries to persons fixing maximum prices on processed fruits and vegetables by grades except where standards have been in general use. . . . By indirection it nullifies the expressed will of Congress in passing the Stabilization Extension Act with no changes in the Taft Amendment. . . . No opportunity was given to all persons interested to present their views, nor to Congress to focus its attention upon the merits of the standards issue. . . ."

Senator Maloney, also member of the Senate Banking and Currency Committee, which reported the Second Deficiency Appropriation Bill, protested that the canners had made no attempt to appear before the Senate Banking and Currency Committee when the bill was under consideration. "I now reluctantly come to the conclusion," he declared, "that their action is based upon the fact that they were unwilling to put this question to a test before the committees dealing with this legislation."

[1] For articles on the action taken by Congress on OPA and standards, see INDUSTRIAL STANDARDIZATION, May 1943, p. 141; July 1943, p. 205; Nov. 1943, p. 299.

[2] July 1943, p. 205.

Interpretations of the Rider Differ

Difference of opinion exists on whether the AMA standards are in "general use." Representative Taber of New York, speaking on the amendment to the appropriation bill, declared that the AMA grades are in use by less than 5 percent of the industry.

The Canners Advisory Committee of the OPA in a report to the Price Administrator declared that the AMA grades should not be used on the 1944 pack for the following grounds:

(1) That they are not a valid measure of quality.
(2) That they are illegal under the Taft amendment.
(3) That they are unenforceable.

On the other hand, twelve consumer organizations have urged the Price Administrator to use the AMA grades.

According to Paul Williams of the Agricultural Marketing Administration, now with the War Food Administration, between 55 and 60 percent of the pack is tied to AMA standards. This estimate includes the Army's purchases, based on federal specifications which parallel AMA standards, the output of packers who use the Department of Agriculture's continuous-inspection service, and the A-B-C labeled brands of the large chains—A & P, Kroger, Grand Union, D. Pender Grocery Company, and the wholesale cooperatives.

OPA Announces Its Policy

Following adoption of this new legislation, the Office of Price Administration, according to its announcement, made an attempt to use standards describing the commercial grades in maximum price order for the 1944 pack. In order to do so it was necessary to reduce the grades to writing, but when the attempt was made in the case of canned peas, the pea canners, called in consultation, declared that the grades cannot be put on paper because flavor cannot be defined.

On July 24, the OPA announced a ruling to this effect explaining that "The United States Standards (formerly called the AMA Grades) . . . are written specifications for the commercial grades. The United States Standards, which thus constitute a presumptive test of conformity to grade, are not, as has sometimes been supposed, a separate system of grades distinct from so-called commercial grades. They are rather written specifications for the commercial grades. The grades themselves are those universally recognized in commercial practice—for example, in the case of canned peas, fancy, extra-standard, and standard.

"The U. S. Standards are not only specifications for the established commercial grades, rather than a separate system of grades, but they represent the culmination of a long effort by the Department of Agriculture to reduce to writing the elements of the general commercial understanding of those grades. This effort has been carried on by a process of constant consultation with the trade. As a result of this consultation and of experience with the use of the specifications, they have been modified from time to time until now there is unquestionably the closest identity between the quality elements of the grades and the commercial understanding. The United States Standards are adapted to the purposes for which they are used in the supplement because they are, with one exception, the only available written statement of the elements of—that is, the specifications for—the established commercial grades."

Decision to use the United States Standards was made by OPA, according to its announcement, after conferences with canned goods brokers who serve as arbitrators in trade disputes involving grades and who told the OPA that when there is difficulty in settling the dispute, they refer to the AMA grades.

The AMA grades actually started as a service to the canners themselves. In the early 1920's many undercapitalized canners found it necessary to turn to the banks for help. The banks, however, demanded warehouse receipts, guaranteeing the quality of the goods on which they were lending their money. Commercial grades were too nebulous for such use, and the Department of Agriculture therefore started work on government grades in 1926. When the Agricultural Marketing Administration, in the early thirties, began to suggest that the A-B-C grades be placed on the labels of the cans for the consumer to use, opposition to the program developed.

"The canners might have had no quarrel with government grades if they had been confined to their original purpose of regulating dealings between trade buyers and sellers," states *Business Week*.

OPA itself claims that the canners are resisting AMA grades because they provide the chief barrier to wholesale upgrading and price evasion, according to *Business Week*.

"This accusation was sharply pointed up this week (July 15) when OPA filed a triple damage suit for $1,114,408 against California Packing Corporation," states *Business Week*. "Among the big canners, Calpack has been the bitterest opponent of A-B-C grade labeling.

"The suit charges Calpack with (among other violations) widespread upgrading of canned fruits and vegetables, both those which were formula-priced on the basis of commercial grades in the 1942 and 1943 packs, and those which were flat-priced under AMA grades last year. OPA expects that the case will prove to be a decisive test of the enforceability of AMA standards (although OPA has won other enforcement actions on the basis of government grades)."

When OPA issued price orders based upon AMA grades for red cherries, asparagus, and spinach, the canners, according to the *Washington News*, stated that they won their case in Congress but were defeated by OPA administrative activities.

On the other hand, *The Canning Trade*, leading organ of the industry, commented that OPA had "not contraverted the august will of Congress. Just the reverse; they have implemented it; made its use possible."

Comptroller General Overrules OPA Use of AMA Grades in Canned Goods

A decision by Lindsay C. Warren, the Comptroller General, (who, rather than the courts, has jurisdiction in the matter) has now been made public declaring that it was the intent of Congress to prevent the use of all AMA grades in pricing by OPA.

On August 5, Chester Bowles, Price Administrator, issued an amendment to his former regulation (Supplement 7 to Food Products Regulation 1, Amendment 1) in order to bring it in line with the ruling of the Comptroller General. In announcing the amendment, Mr. Bowles said:

"There is nothing in the changed regulation which has any direct effect on prices. The legal ceiling prices of the canned fruits and vegetables affected are based on existing commercial grades. The prevention of hidden price increases through upgrading is more difficult. The canning industry has a heavy responsibility to see to it that upgrading does not take place

"The more self-policing the industry does, the less need will there be for enforcement action by OPA. We propose, however, to use our utmost efforts to secure compliance in this difficult field."

Mr. Warren's ruling and the resulting change in the OPA regulations apply only to processed fruits and vegetables. In the rest of the general commodity field the Taft Amendment as enacted in 1943 remains in effect.

Aircraft Standards Committee Asks for Uniform Catalog Data

STANDARDIZATION of the type and amount of information included in catalogs of commercial parts would help aircraft manufacturers use these parts and would tend to stimulate their sale, the National Aircraft Standards Committee believes.

As a result of serious objections on the part of many aircraft manufacturers to the methods used by companies in presenting their catalogs of commercial parts, the Committee recently undertook a study to determine what information the users of commercial parts would really like to have in catalogs. A questionnaire was issued to the 32 prime contractors of airplanes who are members of the committee, listing the more obvious requirements to be fulfilled by a properly planned catalog and requesting comments as to the relative importance of these requirements. The companies were also asked to list any additional requirements that they believed should be included in such catalogs.

The requirements were divided into two categories: (1) those which if omitted from parts catalogs would cause difficulty within the purchaser's plant; (2) those which are desirable but the omission of which could not be construed as causing difficulty in the application of the parts.

The results of the questionnaire showed that airplane manufacturers using commercial parts believe that the following information should always be included in catalogs, and that without it they would be likely to have trouble using the parts.

Necessary Catalog Requirements

1. Parts should be identified by name and number.
2. Catalogs should carry the date of release. In the case of loose-leaf catalogs, the date of the latest page revision should appear on each page.
3. Sufficient information to allow practical application of the part should be shown, such as envelope size, tolerances, location and size of electric, hydraulic, pneumatic, or other connections.
4. Changed parts should be given new numbers or dash numbers unless dimensionally and functionally interchangeable.
5. Maximum strength or capacity of parts should be specified.
6. Type and specification number of the material from which the part is fabricated should be shown. Government drawing or specification numbers to which the part may be manufactured should also be noted when applicable.
7. Method of interpreting coded part numbers should be specified.
8. All pages should be numbered.
9. Parts having general government approval for use on aircraft should be noted.
10. Catalogs should be carefully indexed.
11. Special information necessary for proper installation of the parts should be specified.
12. Information regarding the proper method of ordering should be included when necessary.
13. The accurate actual weight of all parts should be shown. If at any time the calculated weight is used in lieu of the actual weight, it should be so specified.

The following information is desirable in catalogs but lack of it would not necessarily cause trouble in use of the parts, the questionnaire indicated.

Desirable Catalog Requirements

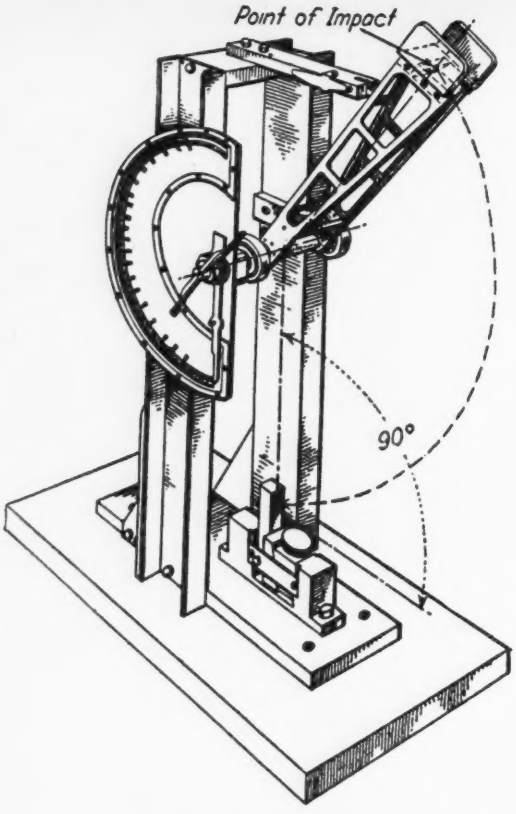
1. Catalogs should have an identifying number.
2. Special tools necessary to install parts should be listed.
3. Related drawings giving more detailed information should be referenced when available.
4. Catalogs should be approximately 8½ x 11 inches in size to facilitate filing.

"There are a number of additional items which are sometimes associated with the cataloging of products, such as cutaway views or the more elaborate overlay method of showing internal construction; individual tracing sheets or templates, for the convenience of draftsmen; tables and charts on performance, etc," the National Aircraft Standards Committee declares. "The actual necessity or desirability of including these in the catalog will depend mostly upon the individual case. Listing of prices is often a matter of concern in compiling catalogs. Because of the complications involving discounts for quantity purchases, the fluctuation of prices and other variations which enter into the price schedule, it is believed desirable to recommend that in most cases this information be supplied as a supplement to the catalog or listed in an independent document."

New Book on Time and Motion Study

WORK METHODS MANUAL. By Ralph M. Barnes. John Wiley & Sons, New York, and Chapman & Hall, London, 1944. Cloth, 5½ x 8½ in, 136 pp, 110 figs., $1.75.

The development of the most effective "standard" methods of work, particularly in repetitive manufacturing, calls for the application of the principles of motion, time, and fatigue study. Professor Barnes' book explains these principles in simple and clear language and illustrates them in an attractive manner by means of cases taken from everyday life as well as from factory work. The book also deals with the standard "tools" used in work analysis, such as process charts, flow diagrams, man and machine charts, and simo (simultaneous motions) charts. (J. G.)



Cantilever beam impact machine determines fracture point of plastic materials

Tests for Insulating Materials Increase Efficiency of Electrical Equipment

ELECTRICAL and communications equipment has an important place in our war production today. Even where it does not form part of the actual combat equipment, it is essential in its production and transportation. Electrical equipment, however, is only as efficient as its weakest part. Although the insulators or insulating materials used are not necessarily the weakest point, they are always an important and critical part of any electrical or communications apparatus, and since there are no perfect insulators, the careful selection and control of the insulating materials is essential to the proper functioning of equipment. The extremes of climatic conditions in which the Armed Forces operate today, and the need for ruggedness, light weight, and compactness in war equipment, therefore, have increased the problems of selection and control of suitable insulation.

Several standards prepared by the American Society for Testing Materials and the National Electrical Manufacturers Association, adopted by the ASA committee on this subject and approved recently as American Standard, aid considerably, however, in measuring and specifying the quality of electrical insulation. The ASA committee operates under the sponsorship of the ASTM and NEMA. The standards are:

Methods of Testing Electrical Insulating Oils (ASTM D117-43; ASA C59.2-1944)

Methods of Testing Shellac Used for Electrical Insulation (ASTM D411-42; ASA C59.18-1944)

Methods of Testing Molded Materials Used for Electrical Insulation (ASTM D48-43T; ASA C59.1-1944)

Methods of Test for Impact Resistance of Plastics and Electrical Insulating Materials (ASTM D256-43T; ASA C59.11-1944)

Methods of Testing Sheet and Plate Materials Used in Electrial Insulation (ASTM D229-43; ASA C59.13-1944)

Laminated Phenolic Products Standards (NEMA Pub 39-57; ASA C59.16-1944)

Standard Practice for Machining and Punching of Laminated Phenolic Plate (NEMA Pub 39-58; ASA C59.17-1944)

The first five of the standards listed were developed by Committee D-9 on Electrical Insulating Materials of the American Society for Testing Materials. The last two, on laminated phenolic products are the result of work by the Advisory Technical Committee of the Laminated Products Section, National Electrical Manufacturers Association.

Although these standards are relatively recent in their adoption as American Standard, they are by no means new in the electrical insulation field. Some of them were first published twenty to twenty-five years ago. They have undergone constant development, revision, and improvement since that time. Their present development is such as to warrant their adoption as American Standard but they will continue to undergo improvement and development to match further improvements in the electrical insulating materials and

plastics industries, and to meet new requirements in electrical and communications apparatus.

The high degree of refinement achieved in the development of present day electrical apparatus, such as transformers, switches, capacitors, and electrical cables, has only been made possible by marked improvements in the quality of the materials entering into their manufacture. Insulating oils are an integral part of such electrical apparatus and the improvement in the quality of oils had to go hand in hand with improvement in the other materials. Great progress has been made in perfecting insulating oils since the first successful oil-immersed transformer was built in 1894, and today the manufacture of petroleum oils has become a highly specialized industry of major importance.

Standard Methods of Test Made Necessary

As improvements in insulating oils were made, it became increasingly evident that standard methods of test to control their quality were of paramount importance, and as a result of a long series of investigations and study by ASTM Committee D-9 there was adopted in 1924 the nucleus of the present method of testing insulating oils. Continuous study and research by this committee have resulted in revisions of the methods and further study will result in changes and improvements necessitated by new requirements of the electrical industry.

The standard on testing oils contains methods of sampling, tests for dielectric strength, sludge formation, mineral acids, free and corrosive sulfur, viscosity, and a number of tests to insure uniformity. Very slight contaminations, especially traces of moisture, can ruin the effectiveness of an insulating oil, and great care must be taken in the sampling of containers of the oil or apparatus in service. The standard covers complete details of the sampling procedure which must be followed if consistent results are to be obtained.

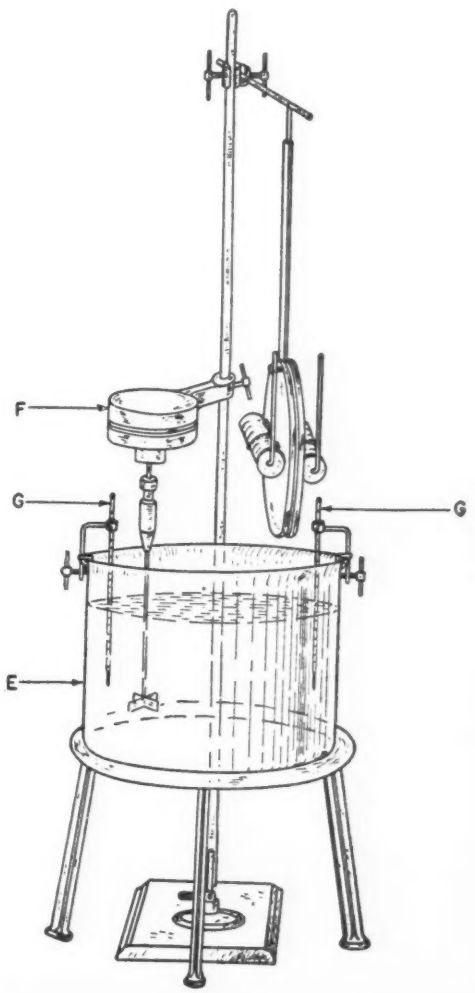
The dielectric strength test is of major importance as a measure of the ability of the oil to resist voltage breakdown. Many years of experience have resulted in the present very carefully standardized method which has been found necessary to obtain reproducible results. The useful life of an insulating oil has been found to depend almost entirely on its stability to oxidation and its tendency to form sludge. This test is included by reference. Many years have been spent in its development, but much further work is necessary before it can be considered as final. Mineral acids and free and corrosive sulfur are very harmful in insulating oils and, if present, can cause failure of electrical apparatus in a short time. These tests are included as a precaution, although modern methods of refining practically exclude any possibility of these substances being present.

Viscosity Included in Examination

Viscosity is included in the examination of all insulating oils. It is important when the oil is used as a cooling medium as well as an insulator in apparatus such as transformers, or when the oil is used to extinguish arcs formed in the operation of electrical switches. Viscosity is also important when insulating oils are used to impregnate other dielectrics, such as in cables, as the ease and completeness of the impregnation is dependent upon the viscosity of the oil.

Other tests, such as specific gravity, color, flash point, pour point, neutralization number, saponification number, and the steam emulsion test, are included largely as directive tests to control uniformity of shipments from suppliers and to give an indication of the degree of refinement of the oils.

The methods of testing molding materials were issued originally in 1917 and have undergone continuous development and improvement under the jurisdiction of ASTM Committee D-9 since that time. Originally these methods described a few tests in complete detail. Later, as test methods for other properties have been written by Committee D-9 and made applicable to a variety of electrical insulating materials, reference has been made to them in the standard, supplemented by such statements of exceptions or additional instructions as were needed. In its latest issues the standard has evolved into instructions simply for preparing molded electrical insulating materials for applicable ASTM tests which have been developed, identification of the particular test methods by which the test specimens are to be tested, and any exceptions in or additions to instructions given in the latter which need be made. The test methods have been the methods commonly used to measure either electrical or mechanical properties



Standard flow-test apparatus used in testing shellac for electrical insulation

of various types of thermo-setting materials, particularly those based on phenol formaldehyde or similar resins, despite their apparent restrictions by title to materials used as electrical insulation.

Impact Resistance of Materials Important

The resistance to impact or shock is an important consideration in the selection of materials for most applications. It is particularly important for electrical insulation because of the relative fragility of insulators and their frequent use where shocks are likely to be encountered. The standard method for determining the impact resistance of plastics is substantially the same as that used for metals in which the energy absorbed from a pendulum in breaking a standard specimen is measured. The specimen may be either a simple beam (Charpy) or a cantilever beam (Izod). The equipment is of course smaller and more sensitive than that used for metals. Comparisons of impact strength with failures in service have shown remarkably close correlation for some types of insulation and the test is one of the most useful measures of the mechanical properties of an insulating material.

The methods of testing sheet and plate materials cover the tests of stiff flat insulation such as phenolic and other types of laminated sheets, hard rubber, asbestos composition board, and the like. They probably find their widest use in testing laminated thermo-setting sheet and are used for testing sheets intended for mechanical use as well as those made for electrical insulation. The standard covers the measurement of physical properties such as tensile strength, flexural strength, compressive strength, bonding strength, Rockwell hardness, and flammability, in complete detail. Other tests, such as resistance to impact, water absorption, dielectric strength, power factor, and dielectric constant, refer to methods established for a wide range of materials but give the details of conditioning, specimen size, and similar instructions necessary for the particular type of material. The special provisions necessary for electrical tests parallel to the laminations are also covered by the method.

The standards on laminated phenolic products cover paper, fabric, and asbestos base materials in the form of sheet, rod, and tubing for both electrical and mechanical uses. These standards were first issued as tolerances for dimensions of sheets, rods, and tubes. Later, quality limits were established, and the standards have been amplified and improved from time to time since then. In their present form these standards have become a valuable guide to industry, resulting in greater uniformity of engineering and manufacturing practice and improved quality of products. The dimensional standards have been almost universally recognized and incorporated in industrial and government specifications. The physical and electrical properties have also served as a basis for ASTM, Federal, and numerous commercial specifications. These standards have provided a satisfactory source of material for the majority of general applications, although for certain radio applications and for other special fields, special specifications have been developed by various groups to emphasize the properties required by these applications.

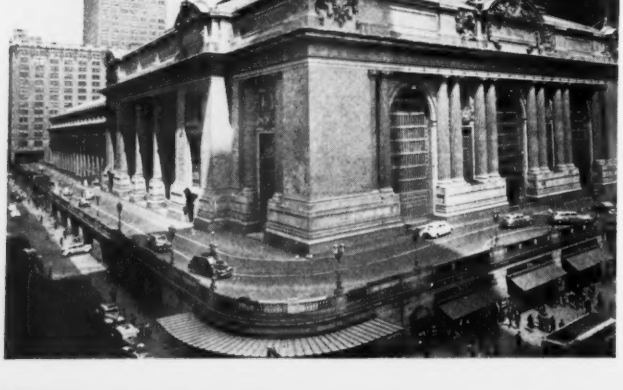
Manufacturers Experience Used as Basis

The standard on machining and punching laminated phenolic plate is based upon the experience of the manufacturers of the material in their own fabricating operations. The equipment and tools for phenolic plate are similar to those used for metals. The different character of the phenolic materials makes it desirable, however, to use somewhat different speeds, tool designs, and methods from those that are used for metals. This standard is particularly useful at the present time when many manufacturers who are not familiar with laminated materials are finding it necessary to do machine work on them.

How Shellac Is Tested

The methods of testing shellac cover the determination of polymerization time and the test method for flow. These have been found desirable for electrical applications for shellac in addition to the usual chemical tests for insoluble matter, iodine number, moisture content, and similar determinations.

ASA Moves September 7 To Grand Central Terminal Building



Since the start of the war and the greatly increased work on standards due to the war, the American Standards Association has been forced to more than double its staff and to expand its office space to parts of three different floors in the Engineering Societies Building. Similar expansion on the part of some of the engineering societies in the building has now made it necessary for the ASA to leave its offices at 29 West 39th Street and to take space in the Grand Central Terminal Office Building. The move will take place September 7.

After September 7, the address of the American Standards Association will be:

70 East 45th Street.
New York 17, N. Y.
Telephone: MUrray Hill 3-3058

The reception room of the ASA will be Room 2845.

In addition to the entrance on 45th Street, there are also entrances to the Terminal Office Building through the Grand Central Terminal and at 25 Vanderbilt Avenue.

OCR Develops Standards For Low-Cost Clothing

THE first four specifications for low-priced clothing—for men's shirts and shorts and for women's slips and housedresses—have been completed by the Office of Civilian Requirements in its program to encourage production of essential civilian garments in the lower price ranges. Minimum basic dimensions for the different sizes of the finished garments, quality of the fabric, colorfastness to laundering, and requirements for seams, stitching, and construction are included in the specifications. Each dozen garments must take not less than a certain minimum yardage specified for each size.

WPB is inviting requests for allocations of materials for garments to be produced under these specifications.

"The decrease in production of low-cost serviceable goods has been of growing concern to all of us," Willis S. MacLeod of the Office of Civilian Requirements told the American Home Economics Association at its meeting in Chicago. ". . . Admittedly the forces of war have acted to swing the balance of production in favor of higher priced goods, upsetting the normal production pattern between low and high priced merchandise . . . Surveys by OCR . . . have shown the existence of unserviceable goods and of goods selling at too high prices for the quality offered."

The means by which the OCR and the WPB plan to encourage greater production of low-cost garments was described to the home economists by Mr. MacLeod as follows:

"The War Production Board channels to the manufacturer the required materials to produce the goods desired. This system of allocation directs the flow of materials to the manufacturer of the end product as an inducement to attain the production of a prescribed quantity of goods in a given price range. This part of the system is voluntary, for the manufacturer may or may not choose to bid for the goods. Naturally if he does not, he gets no Government assistance in obtaining increasingly scarce materials. This step is essential to the success of any low and serviceable goods production scheme, for in directing the flow of materials to the manufacturer of, say, housedresses, the WPB can also guide the kinds, types, and qualities of the end product to be made. This type of operation is characterized by several special programs which have been recently put in force through a Conservation Order designated as M-328B. . . . These programs provide assistance to obtain designated fabrics for use in the specified items, and establish the minimum yardages per dozen which must be used in each garment to provide adequate fit and full cut. They also set the general defining price category in which the output is to be produced.

Minimum Quality Specifications Planned

"Consideration is being given to the further extension of these special programs to include more concise minimum quality specifications. In addition, plans are now under way to provide fabrics to produce housedresses, women's cotton slips, men's everyday shirts, and men's shorts of specified quality. The OPA is working with the WPB to develop maximum price regulations for these specified items. . . .

"Housedresses will serve to illustrate the operation of these special programs. . . .

"The initial problem is to ascertain the types and quantities of fabrics normally used to produce a serviceable housedress to sell at a price within the reach of all. Unfortunately, the housedresses we know you would prefer, based on historic buying patterns, are made of the same fabrics and by the same garment makers who supply not only the military goods but girls' dresses, boys' shorts, children's shirts, and a host of other items. We cannot withdraw the fabrics and the labor for housedresses without examining the effect it will have upon other important and necessary requirements. So we must determine the proportionate quantity of the fabrics and producing capacity which can be assigned to make the number of dresses required.

Define Serviceable Housedress

"Our next step is to define a serviceable housedress in the price range desired. Specifications are developed with the help of the manufacturers and retailers and technical people and representatives of groups such as your own and of course the other agencies concerned, notably the OPA. Concurrently with setting up the machinery for manufacturers to claim their cloth for the production, the OPA establishes the maximum prices at which the housedresses will sell. . . .

"These quality production price controls vary—one commodity to another—and several methods can be used to obtain the quantitative production in the qualities and in the price ranges required. The methods are:

1. Definition through broad specifications of the minimum quality in the price ranges required.
   (*a*) Specifications are confined to requirements covering end-product performance, construction, or material. Style factors and individuality of models are of course left free of control.
   (*b*) It is often desirable to control maximum quality in order to limit the number of less functional operations which may be applied, such as overfinishing or excessive decorative workmanship operations which raise the cost out of all proportions to the serviceability desired in this range of goods, and expend labor and trimmings. This may be controlled by specific price ceilings which automatically limit the amount of non-functional operations that can be applied; or when necessary by specific restrictions on the excessive operations.

2. Division of the base-period output in the required price ranges accompanied by allocations, priority or other applicable material channelling controls.
   (*a*) Division may be done percentage-wise, through assignment of quotas, or limitation on quantitative output—whichever is most feasible.
   (*b*) Allocations may involve either raw or processed materials depending upon which is controlling for the end product.

3. Re-examination of price regulations to eliminate inequities, and to favor low price goods.
4. Extension of simplification to eliminate unnecessary types, varieties, models, and sizes to the degree indicated by requirements and available resources.

"In determining the order of importance of the commodities to which these programs should be extended, first consideration is given to those essential cost-of-living items which are:

(*a*) in short supply,
(*b*) excessively low in quality,
(*c*) unavailable in medium and low price lines.

"I should like to take this opportunity to clarify a serious misconception which has surrounded the use of specifications as a means of assuring reasonably serviceable wartime goods. First, I am unalterably opposed to the development of specifications which stipulate the style and individuality of models of clothing. I am thoroughly convinced that minimum quality specifications which are reasonable can and should be developed which will allow manufacturers virtually complete freedom from limitations on styling and individuality. . . . The manufacturer is thus able to utilize existing machinery, patterns, dies, and his other manufacturing facilities within the framework of reasonable minimum quality requirements which assure the most effective use of our short materials, manpower, and capacity."

Universal Decimal Classification Published by British

The first four completed volumes in the Universal Decimal Classification for libraries which is being published by the British Standards Institution as a British Standard, are now in the library of the American Standards Association.

This work, which may run to a good many additional volumes, sets up a system for classifying books that can be applied to special libraries, as well as to general libraries all over the world. In the decimal classification the use of numbers has eliminated language as a barrier, and any librarian should be able to walk into the library of another country where this system is used and feel perfectly at home.

Detailed Enlargement of Dewey System

The Universal Decimal Classification is, actually, a highly detailed enlargement of the Dewey Decimal System, developed along somewhat the same lines. The Universal classification is, however, more specialized and more intricate. It will prove useful, therefore, primarily to experts and to libraries in specialized fields, since it is designed to accommodate an indefinite number of subdivisions.

This classification was prepared by the Federation International de Documentation with the help of leading experts in many fields. It has been adopted by the International Federation of the National Standardizing Associations for the classification of its documents, and is the most widely used of any single classification. Both the British Society for International Bibliography and the Association of Special Libraries and Information Bureau requested this English edition of the Universal Decimal Classification, with the approval of the Education Foundation, Lake Placid Club, New York, publishers of the Dewey Decimal Classification. French and German editions have already been published.

The subdivision of the "subject" classes follows the accepted principle, "from groups of wide extent to groups of less extent," that is, there are main classes and auxiliary classes. The main classes such as Philosophy, Religion, Social Sciences, Art, are broken up into auxiliary classes such as psychology, Christian churches and sects, law, architecture. These classes may then be further subdivided.

Relative positions of the main groups are not particularly emphasized. Since various subject groups are almost always spreading and over-reaching other groups, it is virtually impossible to legislate any hard and fast rules in this respect. Consequently, it is expected that various readjustments will be made from time to time. The Universal Decimal Classification is under the continual supervision of experts, in an effort to keep it up to date. The British Society for International Bibliography and a series of international subject secretariats are two of these groups, although the Commission and Secretariat of the Classification of the Hague has the final decision for amendments and extensions.

While it is necessary that fully developed tables be placed at the disposal of experts and specialists, an abridged system formed by the major groups with simpler symbolic representation can be used for the classification of books in smaller libraries.

The Universal Decimal Classification is especially valuable in specialized files owing to its complete detail. It is also well adopted for use in connection with various automatic card-sorting machines.

At the present time, the British Standards Institution has published the following volumes:

Volume I, part 1—General Introduction (price $2.65)	
	Auxiliary Tables
	Class 0 Generalities
Volume II, part 1—Class 50 (price $3.75)	General Works on Pure Science
	51 Mathematics
	52 Astronomy, Geodesy
	53 Physics
Volume II, part 2—Class 54 (price $3.75)	Chemistry
Volume II, part 3—Class 55 (price $3.75)	Geology, Geophysics
	56 Paleontology
	57 Biology
	58 Botany
	59 Zoology

These volumes may be ordered through the American Standards Association, 29 West 39th Street, New York 18, N. Y.

New Standard Protects Formaldehyde Workers

by Albert S. Gray, M.D.

Member of ASA Sectional Committee on Allowable Concentrations of Toxic Dusts and Gases

THE new American Standard Allowable Concentration of Formaldehyde, Z37.16-1944, has been endorsed and sponsored by the Conference of State and Provinicial Health Authorities of North America and adopted by the American Standards Association. The ASA committee on toxic dusts and gases reviewed the literature on this subject, and performed a number of experimental investigations prior to establishing the standard. The document covers briefly the scope and purpose of the standard, the properties of formaldehyde (HCHO), the permissible concentration, sampling procedure and analytical methods, and a bibliography.

The maximum allowable concentration is established at 10 parts of formaldehype per million parts of air by volume, corresponding to 0.012 milligrams per liter at 25 degrees centigrade and 760 millimeters pressure.

Irritant Qualities of Formaldehyde

Formaldehyde gas is not generally regarded as extremely toxic, but it is definitely irritating to the mucous membranes of the eyes and respiratory system. The hitherto commonly accepted threshold limit or maximum allowable concentration of 20 parts per million has been investigated, both in gas chambers and in industrial atmospheres, and found to cause a definite and pronounced irritation, although no serious pathological disturbances were observed. By similar experiments and determinations it has been observed that where concentrations are less than 10 parts per million, the irritation, if present at all, is of a very minor nature.

The irritant action of formaldehyde on the mucous membrane is due to the formation of an irreversible combination with the protein of the surface cells. In contact with tissues, formaldehyde is changed to formic acid and methyl alcohol.

Industrial Applications

Formaldehyde, in addition to its long use in the chemical industries and as a preservative and disinfectant, is being used to a greatly increasing extent in the manufacture of plastics and synthetic resins for critical war products. Perhaps the most common synthetic resin containing formaldehyde is of the phenol-formaldehyde type. Other resins, such as those containing formaldehyde in combination with cresols, urea, or melamine are becoming more and more important industrially. Formaldehyde is also used to a considerable extent in the treatment of certain textile fibers such as viscose rayon and casein, and for impregnating and laminating other materials. In any of these processes, relatively high concentrations of formaldehyde may be produced in the workroom atmosphere, particularly where the impregnated or coated materials are subjected to high temperatures or drying operations. Relatively high atmospheric concentrations may also result where the surface area of liquid containing formaldehyde is large.

Cases of dermatitis from formaldehyde contained in plastics usually occur through direct contact with the synthetic resin, particularly resin dusts. In individuals who have developed a sensitivity to formaldehyde, however, there may ensue a characteristic dermatitis and irritation on contact with low concentrations of the gas.

Determination and Control

The determination of atmospheric concentrations of formaldehyde involves precision techniques and should be conducted by an experienced and well qualified laboratory worker. Determination of the exposure of the industrial worker in the plant depends upon accurate sampling of the atmosphere breathed by him during a representative operating period. The method used in the laboratory for the determination of formaldehyde may be colorimetric or the more recently developed electrometric type of procedure, both of which are mentioned in the standard.

It has been demonstrated in many plants that the combination of a sound medical program and engineering measures can effectively control formaldehyde dermatitis or respiratory irritations. Cleanliness and avoidance of contact with materials containing formaldehyde are important measures in preventing dermatitis. Local exhaust ventilation and enclosures are effective engineering means of keeping atmospheric concentrations below levels which will cause serious respiratory irritation.

This standard has been developed by the ASA Sectional Committee on Allowable Concentrations of Toxic Dusts and Gases, Z37, under the chairmanship of William P. Yant, Director of Research and Development, Mine Safety Appliances Company.

The American Standard Allowable Concentration of Formaldehyde, Z37.16-1944, may be obtained from the American Standards Association at 20 cents per copy.

A list of other American Standards and American War Standards which define allowable concentrations of toxic substances is given on page 117 of the June, 1944, isssue of INDUSTRIAL STANDARDIZATION.

Important Action on Standards Taken at ASTM Annual Meeting

SIXTEEN formal technical sessions, with several informal round tables, more than 250 meetings of technical committees, and action on a large number of specifications and tests for materials, including more than 50 new standards, made the Forty-Seventh Annual Meeting of the American Society for Testing Materials, June 26 to 30, a notable one.

Other features of the meeting included the Nineteenth Marburg Lecture, on "Textile Fibers—An Engineering Approach to an Understanding of Their Properties and Utilization," by Dr. Harold DeWitt Smith; a guest address on "Minerals in War and Peace" by Dr. Charles K. Leith; and the Symposium on Analytical Colorimetry and Photometry, in which some 15 authorities discussed apparatus and equipment available and the application of various methods in such fields as ferrous alloys, aluminum- and magnesium-base alloys, and others.

More than 55 new tentative standards were accepted for publication for the first time, and 70 existing specifications were proposed for adoption as formal ASTM standards—indicating the intensification of standards work. Part of this increase was due to the advancement by a full year of publication of the Society's *Book of Standards*, to come out late in 1944.

The Marburg Lecture on Textile Fibers, which stressed the importance of an engineering approach to the use of such fibers, is of special interest to ASA Members because of the recent tendency of ASA work to include standards for consumer goods, particularly in the textile field. Dr. Smith emphasized the necessity of realizing that the mechanical behavior of the microscopic beams which we call textile fibers is of primary importance to the strength of a hawser or a pneumatic tire, the comfort of an overcoat or of a summer suit, the utility of a carpet or of a child's play dress. A new philosophy of textiles has been created with the advent of manufactured fibers, he declared. The essence of this new philosophy is that fibers can be designed to meet specific textile needs. The only real limitations on the variety and characteristics of textile fabrics yet unborn will be the ability of the textile designer and technologist to help the fiber maker understand what kinds of fibers are wanted. This is an engineering job, because the engineer stands midway between the scientist and the craftsman, he explained.

Metals

Among the important actions on specifications for metallic materials taken at the meeting was the submittal by Committee A-1 on Steel of two new specifications covering carbon and alloy steel blooms, billets, and slabs for reforgings, to succeed the former standard A 17-29 (ASA G9.1-1933). Committee A-1 also proposed four new specifications covering stainless tubing for tubes for stills and for use in the food and dairy industry.

Committee B-5 on Copper and Copper Alloys recommended revisions in 25 tentative specifications and in 10 full standards. Many of the changes involved chemical requirements; a number include provisions that were issued originally as emergency provisions but now are considered suitable for regular use; and in a number of the specifications tolerances and permissible variations have been incorporated.

Committee B-6 on Die-Cast Metals and Alloys announced the approval of emergency specifications for controlled quality magnesium-base alloy die castings for applications where breakdowns would be extremely serious. In addition to detailed chemical and physical requirements, X-ray controlled production is specified.

A code for identifying magnesium-base alloys, which follows the system of aluminum-base materials, has been adopted by Committee B-7 on Light Metals and Alloys. Letters are used to designate alloy constituents, with numbers used for the approximate compositions.

Building Materials

Among the changes in standards relating to building materials were recommendations from Committee C-1 on Cement for new tests for determining air content of mortar, for determining vinsol resin, and a test for heat of hydration. Certain modifications and strength requirements have been incorporated in the standard portland cement specification (C 150).

A tentative standard for glazed building units has been rather extensively revised by ASTM Committee C-15 on Manufactured Masonry Units. Changes include tolerance on dimensions and warping requirements, and data for ceramic units of two grades and two types.

Committee D-1 on Paint, Varnish, Lacquer, and Related Products submitted seven new specifications covering raw umber, burnt umber, raw sienna, burnt sienna, Venetian red, yellow iron oxide hydrated, and black synthetic iron oxide. These new specifications follow the system used in a large number of other pigment specifications covering composition and properties, number of tests, and methods to be used. Added to the series of tests for evaluating serviceability of various types of paints and paint products is the test for degree of flaking (scaling) of exterior paints of the linseed oil type. This involves a series of photographic reference standards which are primarily for comparative evaluation.

In its report, Committee D-7 on Timber featured proposed methods of testing veneer, plywood, and wood- and wood-base laminated materials. It will undertake to develop specifications for testing fire-retardant wood.

Paper and Paper Products

Committee D-6 on Paper and Paper Products recommended 11 new standards for testing various types of paper and paper products. These standards, developed largely in cooperation with the Technical Association of the Pulp and Paper Industry, include:

Adhesiveness of gummed tape
Bursting strength of paper
Drop tests of shipping containers
Effect of heating on the folding endurance of paper
Flammability of treated paper and paperboard
Hydrogen ion concentration (pH)
Penetration by water of sized paper and paper products (dry indicator method)

Printing-ink permeating of paper (castor oil test)
Puncture and stiffness testing of paperboard
Corrugated and solid fiberboard
Testing containers in the small revolving hexagonal drum-box testing machine
Water-vapor permeability of paper and paperboard

Extensive work is continuing on a number of other tests and work on fiberboard containers will continue active.

Rubber

Committee D-11 on Rubber Products reported two new tentative standards. The first covers specifications for cellular rubber products and was formulated by a special committee organized under Army Ordnance auspices. The second is a new test for the stiffening of vulcanized elastometers at low temperatures.

In the first case, the material covered is of two types grouped into four classifications including sponge, latex, foam, and expanded rubbers. The various test methods are covered in a previously issued Method of Testing Sponge Rubber Products (D552-43 T), in which a number of revisions were accepted at the meeting.

In the second case, the inadequacy of the brittleness test, which was a part of a standard previously approved (D736), resulted in intensive work which has been used in the new tentative standard. Young's modulus in bending is determined at low temperatures and used as a measure of the cold-stiffening characteristics of the material. Provision is made in the method for measuring the stiffening effect produced either by crystallization or by second order transition (vitrification) whichever is involved in the material being tested.

Plastics

Committee D-20 on Plastics has continued its intensive work, part of which is to supply needed standards for use by the Armed Forces, other branches of the Federal Government, and consumers in general. Twelve new tentative standards were submitted to the Society, including four specifications, five test methods, and three recommended practices.

The new specifications cover cellulose acetate sheets; ethyl cellulose; methacrylate; and nylon injection molding compounds.

The methods of test supply new data on reflection and transmission characteristics, and stability of chlorine-containing plastics, as well as more accurate data on flexural properties, and standardized procedures for indentation hardness and specific gravity.

The proposed recommended practices have been developed in an attempt to standardize the technique used in determining the effects produced on plastics by environmental conditions, particularly in connection with the effect of heat and accelerated aging. The recommendations on molding impact specimens of general purpose phenolic materials are the first of this type. Similar recommendations are needed and are being developed for other materials.

Soaps and Other Detergents

Committee D-12 on Soaps and Other Detergents added two new standards to its completed specifications and tests. The new specifications cover liquid toilet soaps and methods of chemical analysis of industrial metal-cleaning compositions. Some of the procedures cover determination of caustic alkalis, silicates, phosphates, sulfates, nitrates, soaps, rosin, antifoaming agents, organic solvents, etc.

ASTM Officers for 1944-1945

P. H. Bates, Chief, Clay and Silicate Products Division, National Bureau of Standards, has been elected president of the American Society for Testing Materials for 1944-1945. Mr. Bates represents the National Bureau of Standards on six ASA sectional committees. He has been chairman of ASTM Committee C-1 on Cement since 1926 and has been active in other Society work. He is a past-president of the American Concrete Institute, and was awarded the Turner Medal by the Institute in 1939 for outstanding leadership in advancing proper utilization of cement and concrete.

Election of the following additional officers for two-year terms was announced at the Society's Forty-seventh Annual Meeting, June 28: Arthur W. Carpenter, Manager, Testing Laboratories, the B. F. Goodrich Company, *Vice-president;* W. C. Hanna, Chief Chemist and Chemical Engineer, California Portland Cement Company, *Member, Executive Committee;* L. B. Jones, Engineer of Tests, Test Department, the Pennsylvania Railroad Company, *Member Executive Committee;* J. T. Mackenzie, Chief Metallurgist, American Cast Iron Pipe Company, *Member, Executive Committee;* J. G. Morrow, Chief Metallurgist, the Steel Company of Canada, Ltd, *Member, Executive Committee;* and Sam Tour, President, Sam Tour and Company, Inc, *Member, Executive Committee.*

Mr. Carpenter has been particularly active in the work of ASTM Committee D-11 on Rubber Products. Mr. Hanna, active on ASTM committees in the cementitious materials field, has made notable contributions as chairman of the Committee on Chemical Analysis of Cement. Mr. Jones is one of the six members of the important Committee E-10 on Standards. Mr. MacKenzie has served a prior term as member of the ASTM Executive Committee, 1932-1934, and is serving currently on Committees A-3 on Cast Iron and E-3 on Chemical Analysis of Metals. Mr. Morrow has been a member of the ASTM for many years concerned especially with the work of Committee A-1 on Steel. He is serving, also, on ASA Sectional Committees B-46 and G-8 as a representative of the Canadian Standards Association.

Terms of service for the following ASTM officers expire in 1945: *Vice-president,* J. R. Townsend; *Executive Committee Members,* T. A. Boyd, W. H. Finkeldey, E. W. McMullen, and E. O. Rhodes.

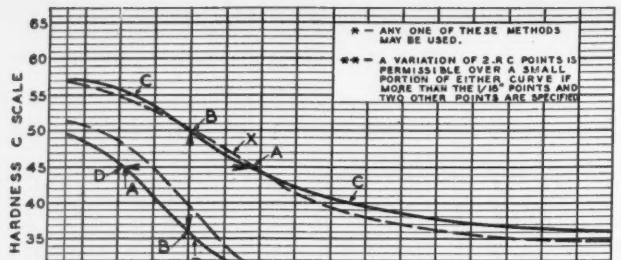

* — ANY ONE OF THESE METHODS MAY BE USED.
** — A VARIATION OF 2 R C POINTS IS PERMISSIBLE OVER A SMALL PORTION OF EITHER CURVE IF MORE THAN THE 1/16" POINTS AND TWO OTHER POINTS ARE SPECIFIED
ROCKWELL HARDNESS C SCALE
DISTANCE FROM QUENCHED END OF SPECIMEN - SIXTEENTHS
A-A J45 = 4/11 SIXTEENTHS.
B-B J36/50 = 8 SIXTEENTHS.
CURVES X-X SEE NOTE **
C-C J35 = 5 SIXTEENTHS (MAX.) J40 = 17 SIXTEENTHS (MAX)
D-D J45 = 4 SIXTEENTHS (MIN.) J35 = 9 SIXTEENTHS (MIN.)

Chart illustrates methods of specifying requirements for 37 standard fine grain steels

Tentative Hardenability Specifications for 37 Steels Prepared by SAE and AISI

A TENTATIVE uniform method of specifying alloy steels by hardenability to expedite wartime manufacture of weapons and armament and to conserve critical materials has been developed jointly by the Society of Automotive Engineers and the American Iron & Steel Institute. The conservation of materials will be accomplished by facilitating the selection and processing of steels on the basis of physical characteristics rather than chemical composition.

The hardenability data are presented in a booklet, "Tentative Hardenability Bands," prepared cooperatively by the Iron & Steel Division, SAE Standards Committee; Iron & Steel Committee, SAE War Engineering Board; and Technical Committee on Alloy Steels, AISI.

The uniform method currently is applicable only to 37 standard fine grain steels of modified chemistries for which tentative hardenability bands have been published. The steels, identified by customary SAE and AISI numbers, plus the code letter "H", include 4100H from 0.30 to 0.50 carbon inclusive; 4340H; 4620H; and the 8600H and 8700H series from 0.20 to 0.50 carbon, inclusive.

For other standard steels, minimum hardenability requirements consistent with minimum chemical compositions are being prepared. These will apply until sufficient SAE standard end-quench hardenability test data for full bands become available from studies now under way.

New Method to be Widely Used

The new method, characterized as epochal and destined to become widely used by design engineers and in metal-working industries, springs from an engineering philosophy of selecting steels on the basis of hardenability as an index of tensile strength, with only corollary reference to chemical compositions, enunciated at SAE meetings for some years. Subsequent to an SAE symposium on hardenability held in 1941 at Detroit, the SAE Iron & Steel Division developed a Recommended Practice on Method of Determining Hardenability, which was published in the SAE 1942 Handbook.

When the long-recognized importance of tests for hardenability was emphasized by the exigencies of war production and the widely fluctuating availabilities of various steels, the SAE War Engineering Board Iron & Steel Committee undertook cooperatively with AISI to collect and to analyze test data so as to establish hardenability bands for "National Emergency" and other wartime steels in larger demand. Later SAE and AISI undertook, through a joint committee, to increase the effort to obtain and to tabulate test data; to determine the hardenability ranges of various steels; and, by revision of SAE standard hardenability test procedures, to improve the correlation between the findings of user and steel-mill laboratories.

ASTM Issues Index to Standards and Tentative Standards

A new edition of the *Index to ASTM Standards, including Tentative Standards* has now been issued by the American Society for Testing Materials. The index lists by subjects and also by number all the standards included in the 1942 *Books of Standards* and the 1943 supplements to them. It makes it possible to locate readily the 1200 standard specifications and tests issued by the ASTM up to the present time.

All the standards, tentative standards, and supplements are listed in the Index under appropriate key words according to the particular subjects they cover. As a convenience, a list is also given of the specifications and tests in numeric sequence according to their serial designations.

Copies of the 225-page publication are furnished without charge on written request to the American Society for Testing Materials, 260 S. Broad Street, Philadelphia 2, Pa.

Cuba Plans Organization Of Department on Standards

Dr. Antonio Gonzalez López, private secretary to the Minister of Agriculture in Cuba, acknowledges receipt of publications and data regarding the Brazilian, Mexican, and United States standards organizations. He had expressed interest in these organizations during a recent visit to Havana by Alberto Magno-Rodrigues, head of the Inter-American Department of the ASA in New York.

The Cuban Department of Industry is a part of the Ministry of Agriculture, and its director, Dr. Leon Aisenstein, is chairman of a committee charged with organizing a Department of Technical Standards. Among other members of this committee are Dr. Antonio Arturo Bustamante, Jr, a well-known lawyer in Havana who was particularly helpful to ASA's New York representative when he was in Cuba, and Prof. Jose Menendez Menendez, a prominent Cuban engineer, who gave valuable assistance to ASA's chief field representative, Cyrus T. Brady, Jr, when he recently passed through the Caribbean republic.

The new Cuban Department of Technical Standards is expected to begin operations soon.

Wide Use of Standards and Labeling in Post-War Trade

"Swift renascence of merchandise standards and consumer informative labeling in the post-war period" was predicted in an article in the *New York Times* recently.

"Quality deterioration of many types of goods has been notable during the war period," stated the article. "This, of itself, will make for a sharp rebound when merchandise once again becomes more freely available. Better definition and control of quality will become paramount.

"Consumer groups, even during the war period, have been pressing for merchandise standards keyed with price and are likely to exert an extremely powerful influence during the post-war period. Better goods at lower prices will be their objective.

"Retailers and manufacturers are fully aware of this and many of them have plans well in hand to take the lead in buying according to standards and specifications, and in training sales people in use of labeling to provide the customer with essential data on merchandise."

Recent Publications Related to Standardization

The following publications closely related to standards, issued recently, may be of interest to ASA Members:

American Society of Mechanical Engineers, 29 West 39th Street, New York 18, N. Y.

The 1943 edition of the ASME Boiler Code, consisting of 9 parts in 8 publications. Price $9, or available separately as indicated below:

Power Boiler Code Including Rules for Inspection. $2.25

The rules in this volume apply to the boiler proper and to piping connections up to and including the valve or valves as required by the Code as well as to superheaters, reheaters, economizers, and other pressure parts connected directly to the boiler without intervening valves.

Material Specifications. $2.25

Specifications for important materials used in boiler and pressure vessels are included in this book. Some of these materials are: boiler steel plates and rivets, steel and iron castings, steel tubes, steel bolting materials, pipe and flanges, wrought iron, and non-ferrous metals.

Boilers of Locomotives. 75¢

Among other subjects, this book includes recommendations for materials, working pressures, thickness of plates and tubes, joint efficiency, braced and stayed surfaces, riveting, safety valves, fittings, hydrostatic tests, welding and stamping.

Low Pressure Heating Boiler Code. 75¢

This book includes rules which apply to steel and cast-iron boilers used exclusively for low-pressure steam heating, hot water heating, and hot water supply. Recommendations cover materials, thickness of plates and tubes, joint efficiency, braced and stayed surfaces, supports, setting and installation, fittings, safety valves, stamping, hydrostatic tests, and welding.

Miniature Boiler Code. 50¢

This code provides complete construction details for small boilers—those which do not exceed 16 feet inside diameter of shell, 42 feet over-all length of outside to outside of heads at center, 20 square feet water heat surface, and 100 pounds per square inch maximum allowable working pressure.

Suggested Rules for Care of Power Boilers. $1.00

These rules cover the ordinary duties of operation and maintenance of steam boilers and appliances, such as handling boilers in and out of service, inspection, preventing causes of boiler failure, and treatment and control of boiler feedwater.

Unfired Pressure Vessel Code. $1.50

Requirements covering materials, riveted joints, dished joints, dished and flat heads, brazing and hydrostatic tests of pressure containers are included in this book. Methods of computing shell openings are included as well as examples of the computation.

Welding Qualifications. 65¢

This book of rules applies to arc- and gas-welding processes. In addition to the welding procedure to follow in construction, the code outlines in detail the operator's qualification tests.

American Welding Society, 33 West 39th Street, New York 18, N. Y.

Guide to Weldability of Steels. $1.00

In this guide the system of ductibility predetermination is presented to welding engineers. There are two parts, the first of which is an explanation of the system for the predetermination and preservation of desired ductility in the heated zone of higher carbon and low-alloy steels during welding. Part two is an instruction manual with examples of the use of the system to select steels and to predict welding conditions necessary for the preservation of desired ductibility in the heated zone. The problem of how to predetermine or otherwise handle loss of ductility in the base metal next to a weld is also presented and only two tests are required—an end quench on the steel and a notch-bend test of the steel.

The Practical Design of Welded Steel Structures. H. M. Priest. $1.00

This recent publication covers the essentials of welding and welded construction. One section deals with the codes of the American Welding Society and unit stresses from these codes form the basis for the numerous charts and tables throughout the book. The various welding processes, specifications for electrodes, types of welds, welding positions, qualification tests and inspection are included in other sections. Weld geometry and stress concentration is treated, also temperature effects, both physical and metallurgical.

Company Member Application for Free Standards

(Must be returned by December 1, 1944)

Company Members of the American Standards Association are entitled to one free copy of each newly approved American Standard for the first $50 of annual membership, and an additional copy for each $100 beyond this.

NAME ..... STREET .....

Person eligible to return list (We can give you his name, if necessary)

COMPANY ..... CITY AND STATE .....

Tear on dotted line

How to Order Your American Standards

- Find out who in your company has been named as representative to return this application.
- Check the standards you want.
- Give your list to your company representative, who will return it to us. The duplicate below is for your files.
- Your company is entitled to a special membership discount of 20 percent on copies over and above your quota of standards furnished by ASA without charge as part of its services to company members. (For explanation of quota, see above.)

No. of Copies	ASA Number	Sponsor's Number	Title of Standard	Price
.....	Z52.21-1944		Acceptance of Photographic Exposure Meters (Reflected-Light, Photoelectric Type) (American War Standard)	.10
.....	Z52.22-1944		Calibration of Photographic Exposure Meters (Reflected-Light, Photoelectric Type) (American War Standard)	.10
.....	Z52.30-1944		Abuse-Testing Mechanism for Photographic Exposure Meters (American War Standard)	.25

DUPLICATE FOR YOUR FILES

August 1944

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.....	Z52.22-1944		Calibration of Photographic Exposure Meters (Reflected-Light, Photoelectric Type) (American War Standard)	.10
.....	Z52.30-1944		Abuse-Testing Mechanism for Photographic Exposure Meters (American War Standard)	.25

Standards Issued by Associations and Government

(For new American Standards see page 170)

For the information of ASA Members, the American Standards Association gives here a list of standards received by the ASA Library during the last month. The list includes only those standards which the ASA believes are of greatest interest to Members.

These standards may be consulted by ASA Members at the ASA Library, or copies may be obtained from the organization issuing the standard. The address of the organization is included for your convenience in ordering.

U. S. Government

Federal Specifications Executive Committee (U. S. Treasury Department, Washington, D. C.)

Federal Specifications

(Copies available from Superintendent of Documents, Government Printing Office, Washington, D. C.)

Belting; round, leather, vegetable-tanned, smooth (superseding KK-B-211) KK-B-211a August 1, 1944

Brushes; scrubbing, clothes (Amendment 3) (superseding Amendment 2 and E-H-B-521, 5/14/43) H-B-521 August 15, 1944

Cleaners, vacuum; electric, portable (Amendment 1) (superseding E-W-C-421a, 4/28/43) W-C-421a July 15, 1944

Cloth; tracing (superseding CCC-C-531b) CCC-C-531c August 1, 1944

Combs; plastic (Amendment 3) L-C-566 August 15, 1944

Copper; bars, plates, rods, shapes, sheets, and strips (Amendment 3) OO-C-501a August 1, 1944

Drills; electric, portable (exclusive of high-frequency types) (Amendment 1) (superseding E-W-D-661, 6/30/42) W-D-661 July 15, 1944

Grinders; bench, electric (Amendment 2) (superseding E-W-G-656, 8/14/42) W-G-656 July 15, 1944

Hose, pneumatic, wrapped (superseding ZZ-H-499 and E-ZZ-H-499, 7/7/42) ZZ-H-499a July 15, 1944

Iron, malleable; castings (superseding QQ-I-666 and E-QQ-I-666, 12/20/41 QQ-I-666a August 1, 1944

Leather; upholstery (Amendment 2) KK-L-291a July 15, 1944

Machines:

- floor polishing and scrubbing; electric (Amendment 1) (superseding E-W-M-46a, 8/14/42) W-M-46a August 1, 1944
- food-mixing; electrically-operated, commercial-type (cake and kitchen) (Superseding E-OO-M-38, 8/19/42) OO-M-38 July 15, 1944
- meat-and-vegetable-cutting; electrically operated (Amendment 1) (superseding E-OO-M-52, 3/9/42) OO-M-52 August 15, 1944
- slicing meat; (Amendment 2) (superseding E-OO-M-81, 3/9/42) OO-M-81 August 15 1944

Matches; safety (wood in boxes; paper in books) (superseding EE-M-101b and E-EE-101b, 4/30/42) EE-M-101c August 1, 1944

Motors; alternating-current, integral-horsepower (Amendment 1) CC-M-641 August 1, 1944

Mowers; lawn, power (Amendment 2) (superseding Amendment 1 and E-OO-M-681, 7/30/42) OO-M-681 August 1, 1944

Paint:

- aluminum-pigment; powder and paste (for) paint (Amendment 1) (superseding E-TT-A-468, 8/28/42) TT-A-468 August 1, 1944
- bone-black; dry (paint-pigment) (superseding part of TT-B-601) TT-B-600 August 1, 1944

Federal Specifications—(Continued)

Paint—(Continued)

- chrome-green; pure, dry (paint-pigment) (superseding part of TT-C-236) TT-C-235 August 1, 1944
- chrome-yellow and chrome-orange; dry (paint-pigments) (superseding part of TT-C-291a) TT-C-291 August 1, 1944
- chrominum-oxide-green; dry (paint-pigment) (superseding part of TT-C-231) TT-C-306 August 1, 1944
- iron-blue; dry (paint-pigment) (superseding part of TT-P-691) TT-I-677 August 1, 1944
- lampblack; dry (paint-pigment) (superseding part of TT-L-71) TT-L-70 August 1, 1944
- ocher; yellow, dry (paint-pigment) (superseding part of TT-O-111) TT-O-121 August 1, 1944
- shellac; orange (Amendment 1) (superseding E-TT-S-271, 4/25/42) TT-S-271 August 1, 1944
- ultramarine blue; dry (paint-pigment) (superseding part of TT-U-451a) TT-U-450 August 1, 1944

Rope; wire (Amendment 6) (superseding Amendment 5 and E-RR-R-571, 1/28/43) RR-R-571 August 1, 1944

Sacks; paper, shipping (Amendment 2) UU-S-48 August 1, 1944

Soap; grit, cake (Amendment 2) P-S-571a July 15, 1944

Thread; linen (Amendment 1) (superseding E-V-T-291a, 6/30/42) V-T-291a August 1, 1944

New Foreign Standards Now in ASA Library

THE following new and revised standards, just received by the American Standards Association, may be borrowed by ASA Members, or ordered through the ASA Library.

Great Britain

Sampling and Analysis of Coal and Coke BS735:1944

War Emergency Standards

Lightly Insulated Cleat Wire for Use on Insulating Cleats BS1096:1944

Metal Collapsible Tubes, Schedule of Sizes and Types BS1049 (1R)—1942

Packaging Index Schedule BS1150—1944

Permitted Uses of Container Sealers, Schedule of BS1163—1944

Short Link Wrought-Iron Crane Chain Excluding Pitched or Calibrated Chain BS394:1944

Draft Standards

Asbestos Cement Spigot and Socket Rainwater Pipes, Gutters, and Fittings (Revision of BS569) CG(ASB) 6686

Asbestos Cement Spigot and Socket Soil Waste and Ventilating Pipes and Fittings (Revision of BS582) CG(ASB) 6687

ASA Standards Activities

American Standards

American Standards Approved Since Our July Issue

Photography and Cinematography Z38
Sponsor: Optical Society of America
Dimensions for Leaders, Trailers, and Roll Film for Aerial Photography Z38.1.41-1944
Designation of Emulsion Side of Photographic Sheet Films Z38.1.42-1944
Dimensions of Inch-Size Photographic Papers Z38.1.43-1944
Designation for Thickness of Photographic Paper Z38.1-44-1944
Dimensions of Front Mounts for Camera Lenses Z38.4.10-1944
Specifications for Projectors for Opaque Materials for Use In Small Auditoriums Z38.7.4-1944
Specifications for Contact Printers Z38.7.10-1944
Specifications for Printing Frames Z38.7.11-1944
Dimensions for Lantern Slides Z38.7.13-1944
Specifications for Lantern Slide Projectors Z38.7.14-1944
Practice for Temperature of Processing Solutions Z38.8.1-1944
Sound Level Meters for Measurement of Noise and Other Sounds Z24.3-1944
Sponsor: Acoustical Society of America

Standards Being Considered by ASA for Approval

Cast-Iron Pipe Flanges and Flanged Fittings, Class 250 (Revision of B16b-1928)
Sponsors: American Society of Mechanical Engineers; Heating, Piping, and Air Conditioning Contractors National Association; Manufacturers Standardization Society of the Valve and Fittings Industry

American War Standards

War Standards Approved Since Our July Issue

Photography and Cinematography Z52
Acceptance of Photographic Exposure Meters (Reflected-Light, Photoelectric Type) Z52.21-1944 10¢
Calibration of Photographic Exposure Meters (Reflected-Light, Photoelectric Type) Z52.22-1944 10¢
Abuse-Testing Mechanism for Photographic Exposure Meters Z52.30-1944 25¢

List of American War Standards

Accuracy of Engine Lathes B5.16-1941 25¢
Allowable Concentrations of Toxic Dusts and Gases Z37
Cadmium Z37.5-1941 20¢
Manganese Z37.6-1942 20¢
Metallic Arsenic and Arsenic Trioxide Z37.9-1943 20¢
Styrene Monomer Z37.15-1944 20¢
Xylene Z37.10-1943 20¢
Clothing—*See* Protective Occupational (Safety) Clothing; Women's Industrial Clothing
Code for Electricity Meters (Revision of Paragraph 827) C12WS-1942 10¢
Color, Specification and Description of Z44-1942 25¢
Domestic Gas Ranges, Approval Requirements Z21.1ES-1942 $1.00
Dry Electrolytic Capacitors (Home Receiver Replacement Type) C16.7-1943 20¢
Electrical Graphical Symbols, Coordination of Z32.11-1944 10¢
Electrical Measuring Instruments C39
Electrical Indicating Instruments (2½- and 3½-Inch, Round, Flush-Mounting, Panel-Type) C39.2-1943 50¢
External Ammeter Shunts for Panel-Type Instruments C39.5-1943 25¢
Shock-Testing Mechanism for Electrical Indicating Instruments (2½- and 3½-Inch, Round, Flush-Mounting, Panel-Type) C39.3-1943 25¢
Dimensions for External Radio-Frequency Thermocouple Converters (120 Milliamperes to 10 Amperes, Inclusive) C39.4-1943 10¢
Gas Water Heaters, Approval Requirements Z21.10WS-1942 $1.00
Machine Tool Electrical Standards C74-1942 40¢
Military Radio Equipment and Parts C75
Ceramic Radio Insulating Materials, Class L C75.1-1943 20¢
Ceramic Radio Dielectric Materials, Class H C75.4-1943 20¢

List of American War Standards—(Continued)
Military Radio Equipment and Parts—(Continued)

Crystal Unit CR-1()AR C75.11-1944 25¢
Dynamotors C75.13-1944 35¢
External Meter Resistors (Ferrule Terminal Styles) C75.5-1943 25¢
Fixed Ceramic-Dielectric Capacitors C75.12-1944 35¢
Fixed Composition Resistors C75.7-1943 60¢
Fixed Mica-Dielectric Capacitors C75.3-1943 50¢
Fixed Paper-Dielectric Capacitors (Hermetically Sealed in Metallic Cases) C75.16-1944 60¢
Glass Radio Insulators C75.8-1943 50¢
Glass-Bonded Mica Radio Insulators C75.6-1943 25¢
Method of Noise Testing Fixed Composition Resistors C75.17-1944 20¢
Porcelain Radio Insulators C75.14-1944 50¢
Power-Type Wire-Wound Rheostats C75.9-1944 50¢
Steatite Radio Insulators C75.2-1943 50¢
Toggle Switches C75.15-1944 50¢
Variable Wire-Wound Resistors (Low Operating Temperature) C75.10-1944 40¢
Photography and Cinematography Z52
Method of Determining Freedom from Travel Ghost in 16-mm Sound Motion Picture Projectors Z52.4-1944 10¢
Method of Determining Resolving Power of 16-mm Motion Picture Projector Lenses Z52.5-1944 10¢
Method of Determining Picture Unsteadiness of 16-mm Sound Motion Picture Projectors Z52.6-1944 10¢
Method of Determining Uniformity of Scanning Beam Illumination of 16-mm Sound Motion Picture Projectors Z52.7-1944 10¢
Specification for Multi-Frequency Test Film Used for Field Testing 16-mm Sound Motion Picture Projection Equipment Z52.8-1944 10¢
Specification for 3,000-Cycle Flutter Test Film for 16-mm SoundMotion Picture Projection Equipment Z52.9-1944 10¢
Specification for Buzz-Track Test Film for 16-mm Sound Motion Picture Projectors Z52.10-1944 10¢
Specification for Sound-Focusing Test Film for 16-mm Sound Motion Picture Projectors Z52.11-1944 10¢
Sound Records and Scanning Area for 16-mm Sound Motion Picture Prints Z52.16-1944 10¢

Specification for 40-Cycle Signal Level Test Film for 16-mm Sound Motion Picture Projection Equipment Z52.17-1944 10¢
Positive and Negative Splices for Processed 16-mm Sound Motion Picture Film Z52.20-1944 10¢
Reduction Printing from 35-mm to 16-mm Motion Picture Film—Negative Aperture Dimensions and Image Size for 16-mm Duplicate Negatives Made from 35-mm Positive Prints Z52.25-1944 10¢
Reduction Printing from 35-mm to 16-mm Motion Picture Film—16-mm Positive Aperture Dimensions and Image Size for Positive Prints Made from 35-mm Negatives Z52.24-1944 10¢
Contact Printing of 16-mm Motion Picture Film—Printer Aperture Dimensions for Contact Printing 16-mm Positive from 16-mm Negative Z52.26-1944 10¢
Contact Printing of 16-mm Motion Picture Film—Printer Aperture Dimensions for Reversal and Color Reversal Duplicate Prints Z52.27-1944 10¢
Photographic Exposure Computer Z38.2.2-1942 $1.00
Pressure Ratings for Cast-Iron Pipe Flanges and Flanged Fittings, Class 125 B16.1-1943 10¢
Pressure-Temperature Ratings for Steel Pipe Flanges, Flanged Fittings, and Valves (Revision of Tables 6 to 11, inclusive. American Standard B16e-1939) B16e-1943 25¢
Protective Lighting for Industrial Properties A85-1942 50¢
Protective Occupational Footwear Z41
Men's Safety Shoes
Men's Safety-Toe Shoes Z41.1-1944
Men's Conductive Shoes Z41.3-1944
Men's Explosives-Operations (Non-sparking) Shoes Z41.4-1944
Men's Electrical-Hazards Shoes Z41.5-1944
} In one volume 40¢
Women's Safety Shoes
Women's Safety-Toe (Oxford) Shoes Z41.2-1944
Women's Safety-Toe (High) Shoes Z41.7-1944
Women's Explosives-Operations (Non-sparking) Shoes Z41.8-1944
Women's Conductive Shoes Z41.9-1944
} In one volume 40¢
Protective Occupational (Safety) Clothing L18
Leather Aprons L18.1-1944
Leather Cape Sleeves and Bibs L18.2-1944
Leather Leggings (Knee-Length) L18.3-1944
} In one volume 30¢
Leather Coats L18.4-1944
Leather Overalls L18.5-1944
Leather Sleeves L18.6-1944
} In one volume 30¢
Quality Control Z1
Guide for Quality Control Z1.1-1941
Control Chart Method of Analyzing Data Z1.2-1941
} In one volume 75¢
Control Chart Method of Controlling Quality During Production Z1.3-1942 75¢
Replacement Parts for Civilian Radio C16
Dry Electrolytic Capacitors (Home Receiver Replacement Type) C16.7-1943 20¢
Fixed Paper-Dielectric Capacitors (Home Receiver Replacement Type) C16.6-1943 20¢
Home Radio Replacement Parts Simplified List C16.8-1943 20¢
Power and Audio Transformers and Reactors (Home Receiver Replacement Type) C16.9-1943 25¢
Volume Controls (Home Receiver Replacement Type) C16.10-1944 20¢

List of American War Standards—(Continued)

Safety in Electric and Gas Cutting and Welding Operations Z49.1-1944 40¢
Screw Threads B1
Screw Threads of Truncated Whitworth Form B1.6-1944 50¢
Straight Screw Threads for High-Temperature Bolting B1.4-1942 25¢
Women's Industrial Clothing L17
Bungalow Aprons and Wrap-around and Coat Style Dresses L17.1-1944 25¢
Jackets, Shirts, and Aprons L17.3-1944 25¢
Regular and Princess Model Coat Style Dresses L17.4-1944 20¢
Slacks, Dungarees, Overalls, and Coveralls L17.2-1944 25¢

War Standards Under Way

Color Code for Lubrication of Machinery Z47
Cylindrical Fits B4
Linemen's Rubber Protective Equipment J6
Machine Tool Electrical Standards, Revision of C74-1942
Photography and Cinematography Z52
Method of Making Inter-Modulation Tests on Variable Density 16-mm Sound Motion Picture Prints Z52.15
Method of Determining Signal-to-Noise Ratio of 16-mm Motion Picture Prints Z52.38
Method of Making Cross-Modulation Tests on Variable Area 16-mm Sound Motion Picture Prints Z52.39
Method of Determining Printer Loss in 16-mm Sound Motion Picture Printers Z52.40
Photographing Aperture of 35-mm Motion Picture Cameras Z52.35
Picture Projection Aperture of 35-mm Motion Picture Projectors Z52.37
Projector Test Reel for Optimum Adjustment of 16-mm Sound Motion Picture Projection Equipment
Protective Occupational (Safety) Clothing L18
Welder's Leather Gauntlet Gloves L18.7
Protective Leather Gloves, Steel-Stapled L18.8
Asbestos Gloves L18.9
Asbestos Gloves, Leather Reinforced L18.10
Asbestos Mittens L18.11
Asbestos Mittens, Leather Reinforced L18.12
Women's Safety and Powder Caps L18.13
Asbestos Aprons L18.15
Asbestos Cape Sleeves L18.15
Asbestos Leggings L18.16
Asbestos Coats L18.17
Flame-Resistant Fabric
Aprons (Bib Type) L18.21
Leggings (Knee and Hip Length) L18.22
Coats L18.23
Pants L18.24
Coveralls L18.25
Resistance Welding Equipment C52
Electrodes C52.3
Specifications for Design and Construction of Resistance Welding Equipment C52.4
Safety Color Code for Marking Physical Hazards Z53
Safety Code for the Industrial Use of X-Rays Z54
Screw Threads B1
Acme Screw Threads B1.5

New War Project Requested

Methods of Measuring Radio Noise

News of ASA Projects

Bedding and Upholstery (L12)—

The sectional committee is holding a joint meeting with the National Association of Bedding Manufacturers and the National Association of Bedding and Upholstery Law Enforcement Officials August 1, 2, and 3 at Chicago. The meeting will consider the adoption of proposed standards giving definitions of certain types of filling materials frequently used in bedding and upholstered furniture. J. Davis Donovan, Chief Enforcement Official in the State of Maryland, is chairman of the committee and also president of the enforcement officials association.

Fastness of Colored Textiles (L14)—

The sectional committee on fastness of colored textiles, at a meeting June 26, voted that the proposed standard for wash fastness tests for cotton and linen be returned for reconsideration and that recommendations sent to the Federal Trade Commission, October, 1942, be edited and circulated to the sectional committee.

Methods of Measuring Radio Noise—

A proposal for a War Standard for methods of measuring radio noise has been submitted to the American Standards Association by the Edison Electric Institute, National Electrical Manufacturers Association, and Radio Manufacturers Association. It is intended that the standard shall serve as a basis for development of methods for measuring the noise of electrical equipment to meet the needs of personnel on aircraft, military vehicles, and naval vessels and reduce confusion caused by the use of varying instruments and methods.

American Standards

Allowable Concentration of Formaldehyde

Z37.16—1944

20¢ per copy

Sets a safe limit for allowable concentrations of formaldehyde, which is used widely in the manufacture of inks, explosives, rayons, and many other products.

Sixteenth in a series of standards developed through the American Standards Association to set safe limits for the presence of toxic dusts and gases in the air of work places.

LIGHTNING ARRESTERS

for Alternating-Current Power Circuits AIEE 28

C62.1—1944

30¢ per copy

A revision of the standard first approved in 1936.

Covers performance characteristics, service conditions, and tests for lightning arresters.

American Standards Association

29 West 39th St. New York 18